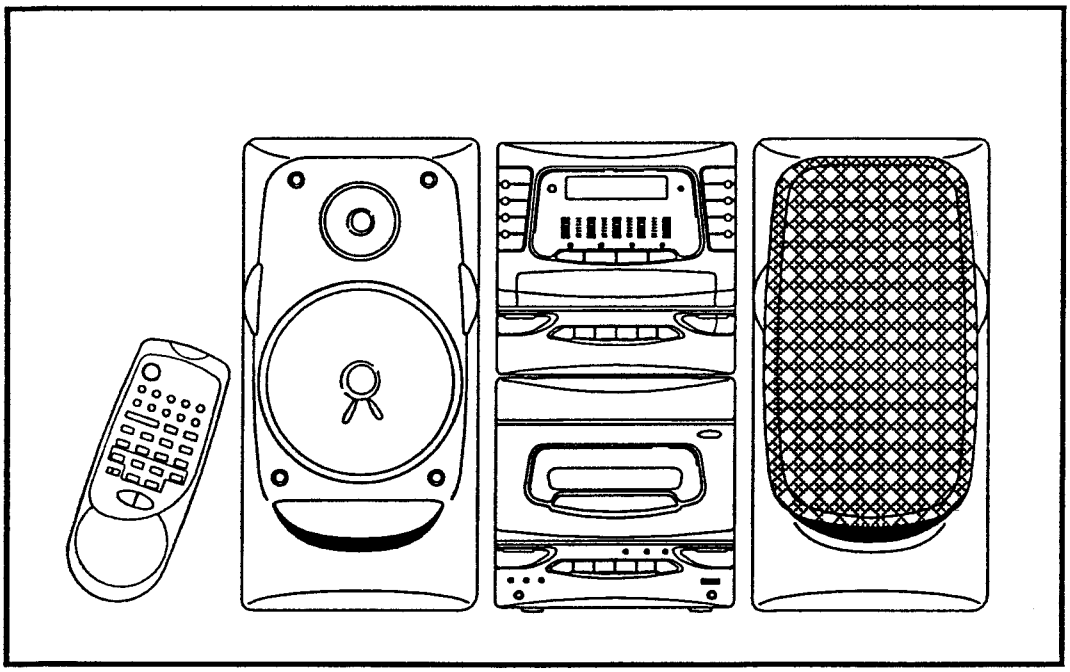
CTC CLATRONIC®

SERVICE MANUAL



MC 056CD

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SPECIFICATIONS		
Power Source	AC 230V/50Hz	
Power Consumption	30W	
Output Power	5W+5W(T.H.D. 10%)	
Dimensions	155m/m(W) X 234m/m(D) X 150m/m(H) X 2PCS	
Weight	5.05Kgs	
TUNER SECTION		
Intermediate Frequency	AM: 450KHz	FM: 10.7MHz
Frequency Range	MW: 522-1620KHz	FM: 87.5-108MHz
Sensitivity	MW: 600uV	FM: 10uV
Multiplex Separation	30dB(AT 1KHZ)	
CASSETTE TAPE SECTION		
Tape Speed	1-7/8 IPS(4.75cm P.S.)	
Frequency Rasponse	125Hz-10KHz	
Wow & Flutter	0.35%WRMS	

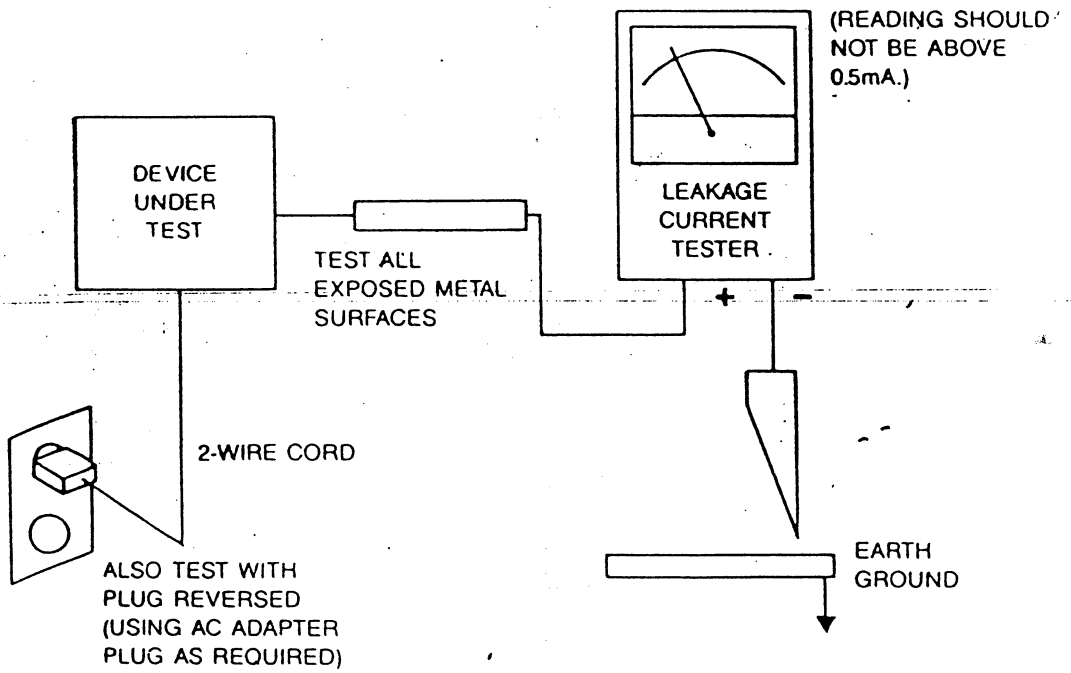
PRODUCT SAFETY INSTRUCTIONS

For continued product safety, the following must be followed during service:

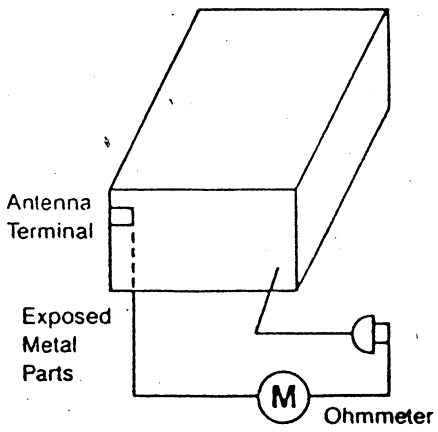
1. Components which are indicated on the schematic diagram with the symbol ⚠ (an exclamation mark in a triangle) must be replaced with the manufacturer's recommended components or components which comply with the manufacturer's specifications.

2. The product should be subjected to the following test when service is completed.
   a. Leakage — Current Measurement Test
      Confirm that the leakage current between both sides of the power supply circuit and any exposed metalparts, such as metal plates, metal screws or terminals of the product, is less than 0.5mA.
      or
   b. Resistance Measurement Test
      Confirm that the resistance between both blades of the power supply cord and any exposed metal parts of the product is more than 2.2M ohms with the power switch in both ON and OFF positions.

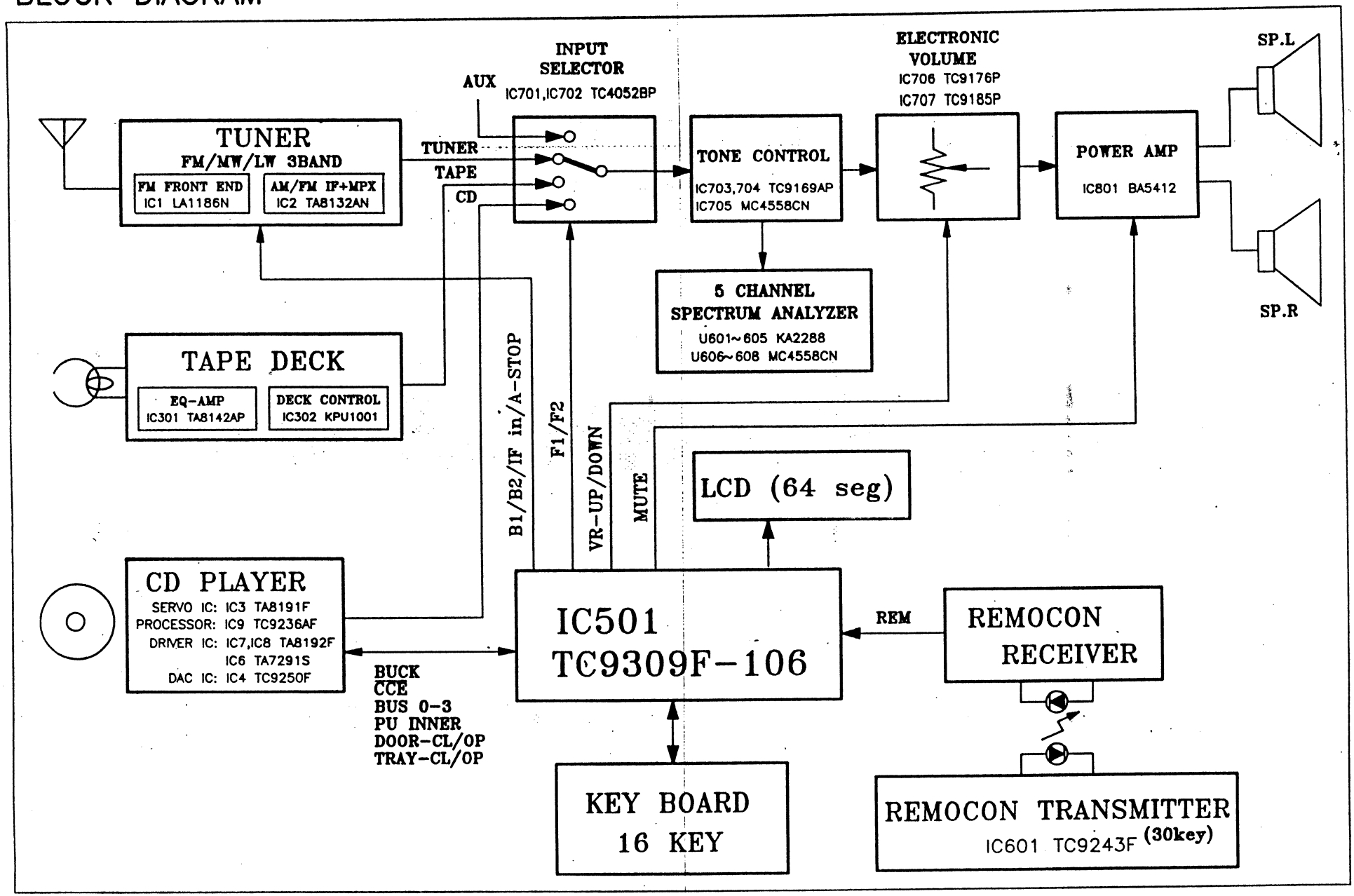
Leakage — Current Measurement Test



Resistance Measurement Test



BLOCK DIAGRAM



ALIGNMENT INSTRUCTIONS

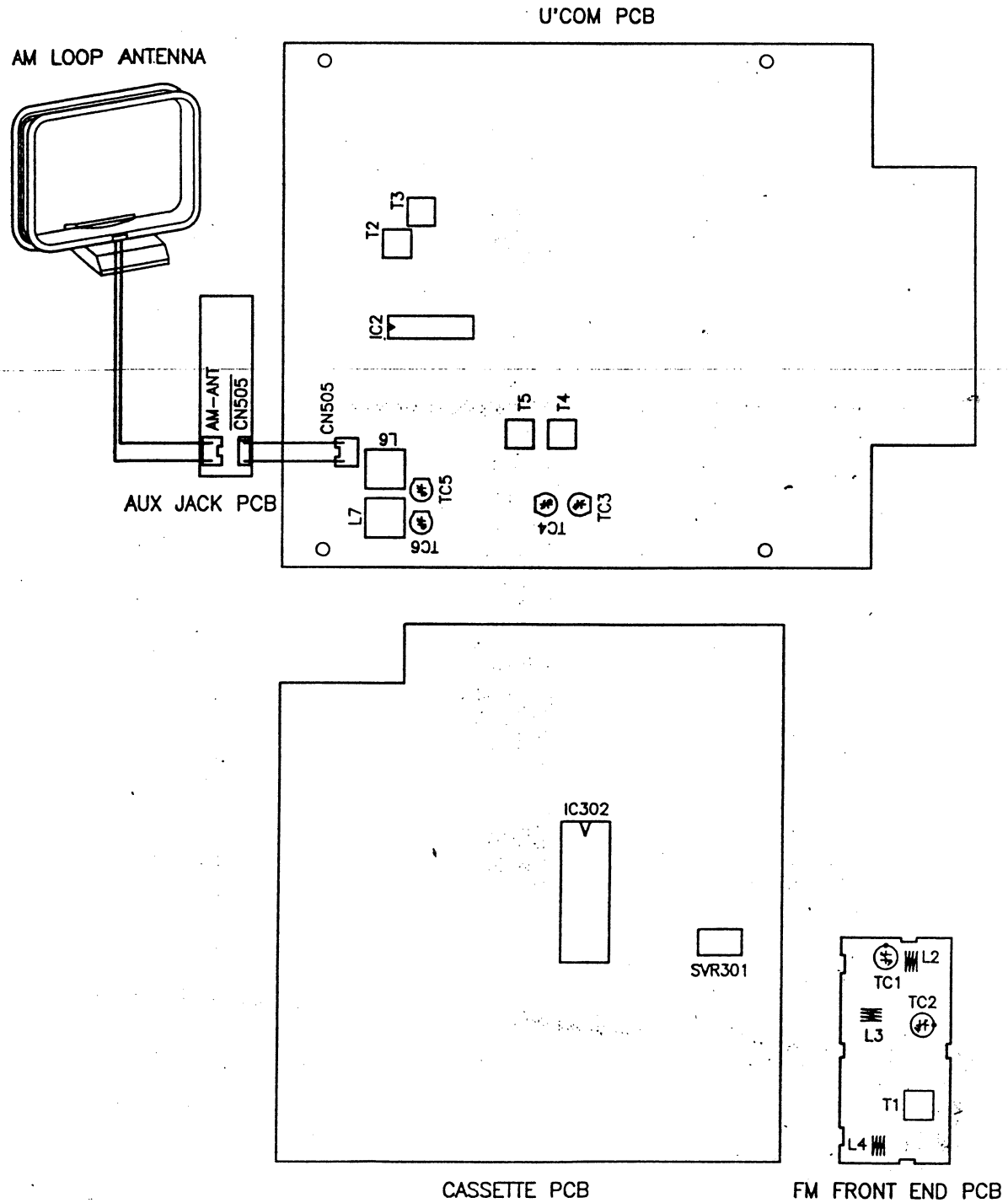
Equipment Required:

1. AM Signal Generator
2. FM Signal Generator
3. IF Sweep Generator with Marker Capabilities
4. Oscilloscope
5. Voltage Meter (VTVM)
6. Frequency Counter
7. Nonmetallic Alignment Tools
8. Attenuator
9. Wow Meter

Important:

1. Check power source voltage.
2. Set function switch to band being aligned.
3. Turn volume control to maximum (unless otherwise noted).
4. Connect low side of signal source and output indicator to chassis ground unless otherwise specified.
5. Keep signal input as low as possible to avoid AGC and AFC action. (Set output indicator to high sensitivity).
6. Standard modulation is 1kHz at 30% amplitude for AM (1kHz at 22.5kHz deviation for FM).

ALIGNMENT POINTS



AM IF

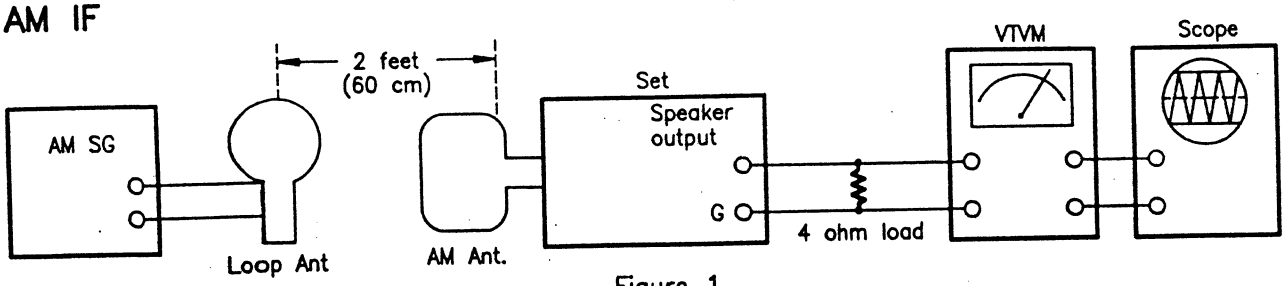


Figure 1

Circuit Alignment	Equipment Connection	Step	Gen. Freq.	Dial Setting	Adjustments
IF	AM signal generator with loop antenna (See Fig. 1)	1	450KHz (1 KHz Mod.)	Tuning to LOWest freq	T2 (AM IFT) Adjust for maximum output.
		2			Repeat until no further improvement can be made

MW BAND/TRACKING

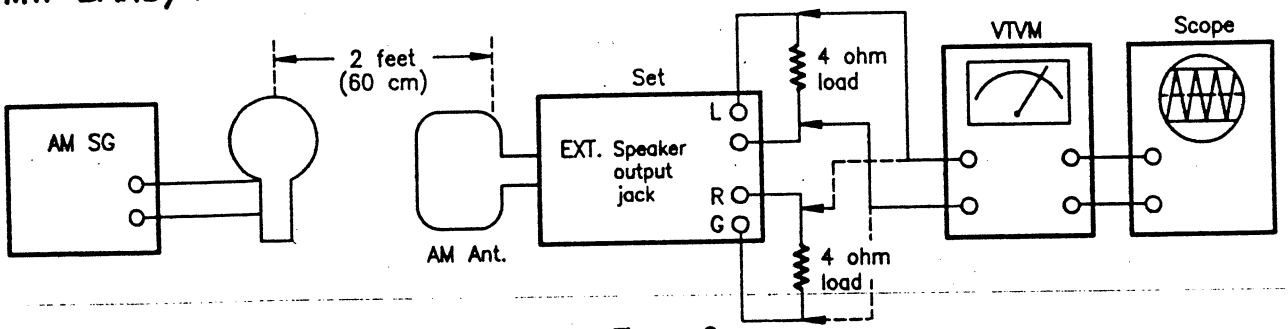


Figure 2

Circuit Alignment	Equipment Connection	Step	Gen. Freq.	Dial Setting	Adjustments
BAND	AM signal generator with loop antenna VTVM across 4 ohm load.(See Fig. 2)	1	522 KHz (1 KHz Mod.)	Tuning to LOWest freq.	T4 (MW Osc. coil) Adjust for maximum output. VT=1.2 Vdc
		2	1620 KHz (1 KHz Mod.)	Tuning to HIGHest freq.	TC3 (MW Osc. trimmer) Adjust for maximum output. VT=7.8 Vdc
TRACKING	AM signal generator with loop antenna VTVM across 4 ohm load.(See Fig. 2)	3			Repeat steps 1 and 2.
		4	612 KHz (1 KHz Mod.)	Tune to signal	L6(MW Ant. coil) Adjust for maximum output.
		5	1404 KHz (1 KHz Mod.)	Tune to signal	TC5(MW Ant. trimmer) Adjust for maximum output.
		6			Repeat steps 4 and 5 several times.

LW BAND/TRACKING

Circuit Alignment	Equipment Connection	Step	Gen. Freq.	Dial Setting	Adjustments
BAND	AM signal generator with loop antenna VTVM across 4 ohm load.(See Fig. 2)	1	150 KHz (1 KHz Mod.)	Tuning to LOWest freq.	T5 (LW Osc. coil) Adjust for maximum output. VT=1.8 Vdc
		2	285 KHz (1 KHz Mod.)	Tuning to HIGHest freq.	TC4 (LW Osc. trimmer) Adjust for maximum output. VT=6.2 Vdc
TRACKING	AM signal generator with loop antenna VTVM across 4 ohm load.(See Fig. 2)	3			Repeat steps 1 and 2.
		4	170 KHz (1 KHz Mod.)	Tune to signal	L7(LW Ant. coil) Adjust for maximum output.
		5	260 KHz (1 KHz Mod.)	Tune to signal	TC6(LW Ant. trimmer) Adjust for maximum output.
		6			Repeat steps 4 and 5 several times.

FM IF

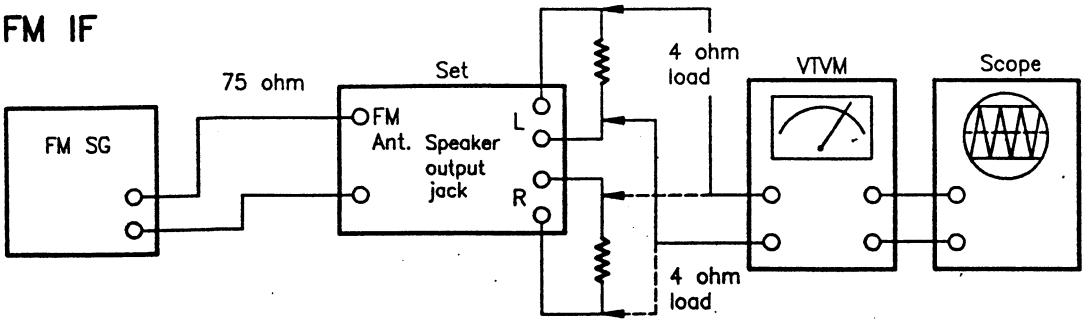


Figure 3

Circuit Alignment	Equipment Connection	Step	Gen. Freq.	Dial Setting	Adjustments
IF	VTVM across 4 ohm load (See Fig. 3)	1	10.7MHz	Tuning to LOWest freq.	T1,T3(FM IFT) Adjust for maximum output.
		2			Repeat. Steps 1.

FM BAND/TRACKING

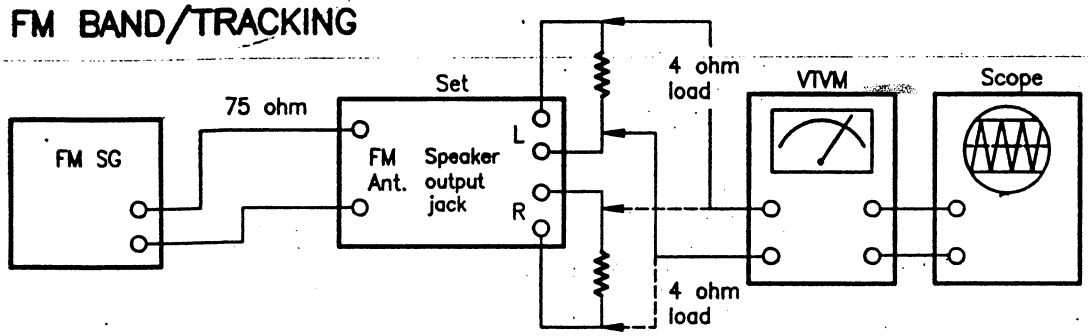


Figure 4

Circuit Alignment	Equipment Connection	Step	Gen. Freq.	Dial Setting	Adjustments
BAND	VTVM across 4 ohm load (See Fig. 4)	1	87.50MHz (Mod.)	Tuning to LOWest freq.	L4 (FM Osc. coil) –stretch or squeeze Adjust for maximum output. VT=1.2 Vdc
		2	108.00MHz (Mod.)	Tuning to HIGHest freq.	Adjust for maximum output. VT=8.0 Vdc
		3			Repeat steps 1 and 2 several times.
TRACKING	VTVM across 4 ohm load (See Fig. 4)	4	90 MHz (1KHz Mod.)	Tune to signal	L2,L3(FM RF coil) Adjust for maximum output– stretch or squeeze.
		5	106 MHz (Mod.)	Tune to signal	TC1,TC2(FM RF trimmer) Adjust for maximum output.
		6			Repeat steps 4 and 5 to obtain suitable sensitivity at 90MHz and 106MHz.

TAPE SPEED and HEAD AZIMUTH(CASSETTE)

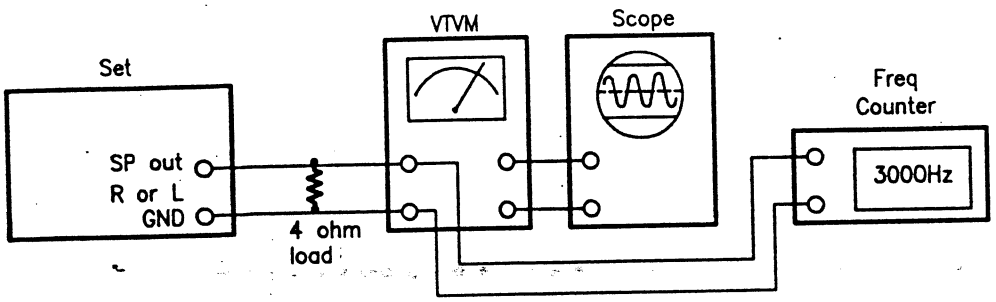


Figure. 5

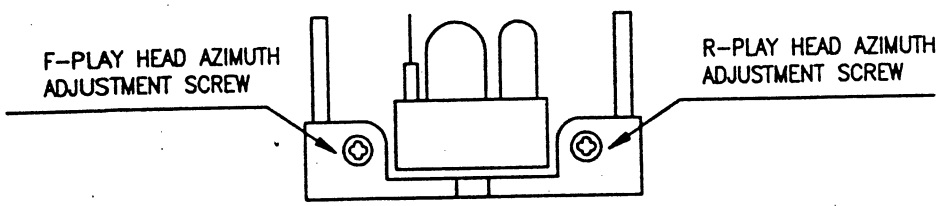
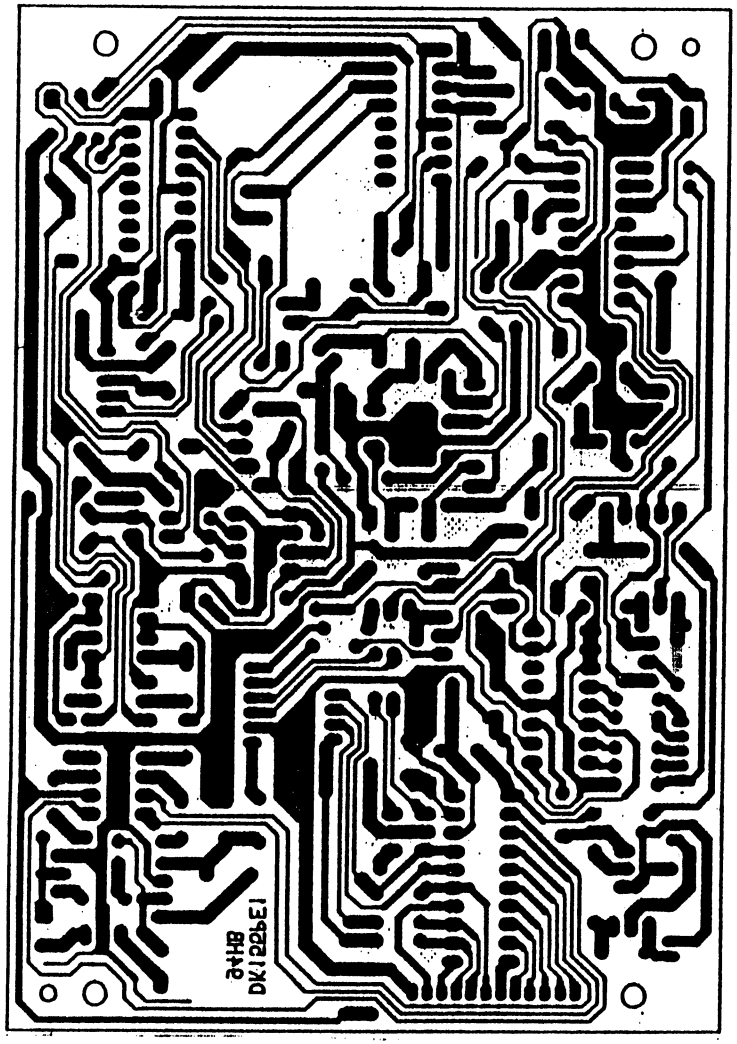
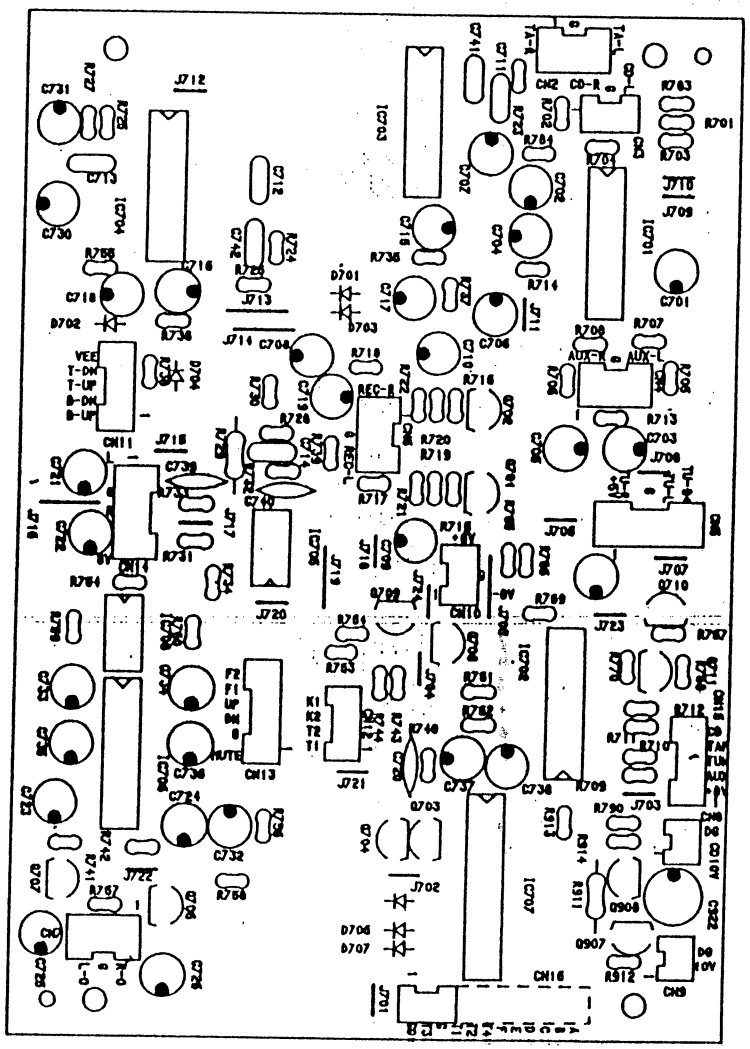


Figure. 6

Step		Description	Setting Condition	Equipment Connection	Test Tape	Adjustments	Remark
1	1	Tape speed adjustment for Tape 1	Playback	Frequency counter connected to SPEAKER OUT(Figure 5)	MTT-111 (3 KHz)	Speed control SVR301 in the DECK PCB.	Adjust for 3000 Hz on counter.
2	1	Head azimuth adjustment for F-PLAY	Same as Step 1-1	VTVM and scope connected to SPEAKER OUT of left CH.	MTT-113C (8 KHz)	Head azimuth control screw (See Figure 6)	Adjust for maximum reading on VTVM.
	2	Head azimuth adjustment for R-PLAY	Same as Step 1-1	VTVM and scope connected to SPEAKER OUT of left CH.	MTT-113C (8 KHz)	Head azimuth control screw (See Figure 6)	Adjust for maximum reading on VTVM.
	3	Repeat Steps 2-1 and 2-2					

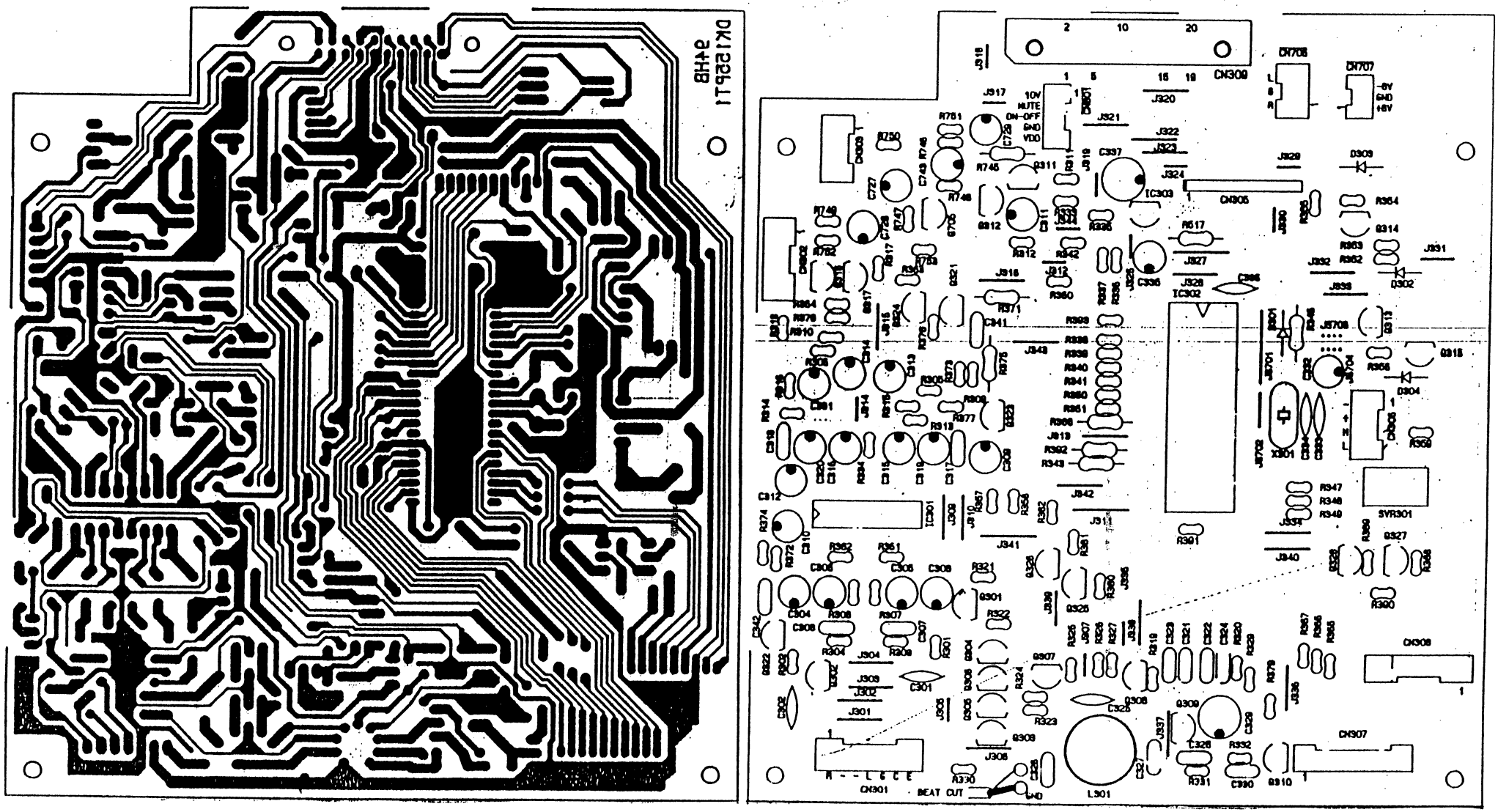
FUNTION PCB (TOP VIEW)



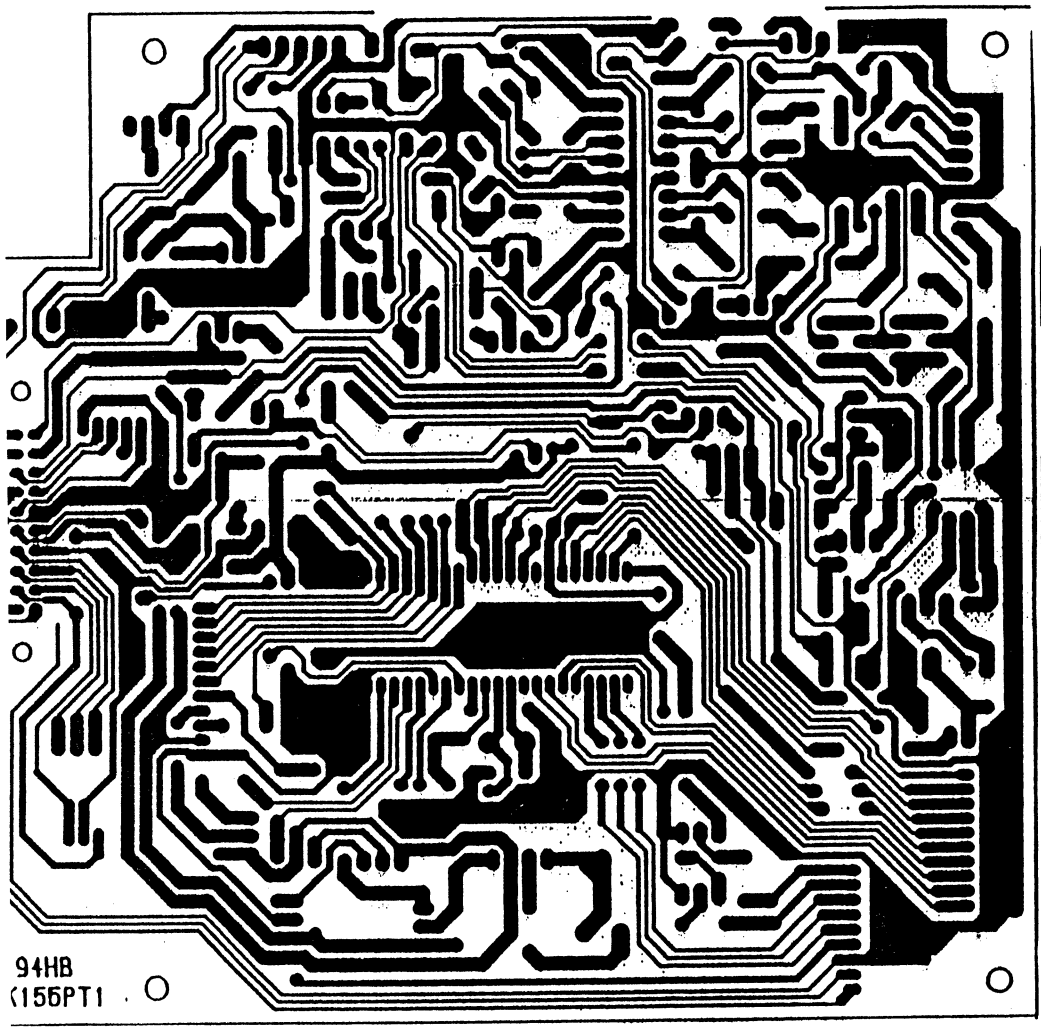


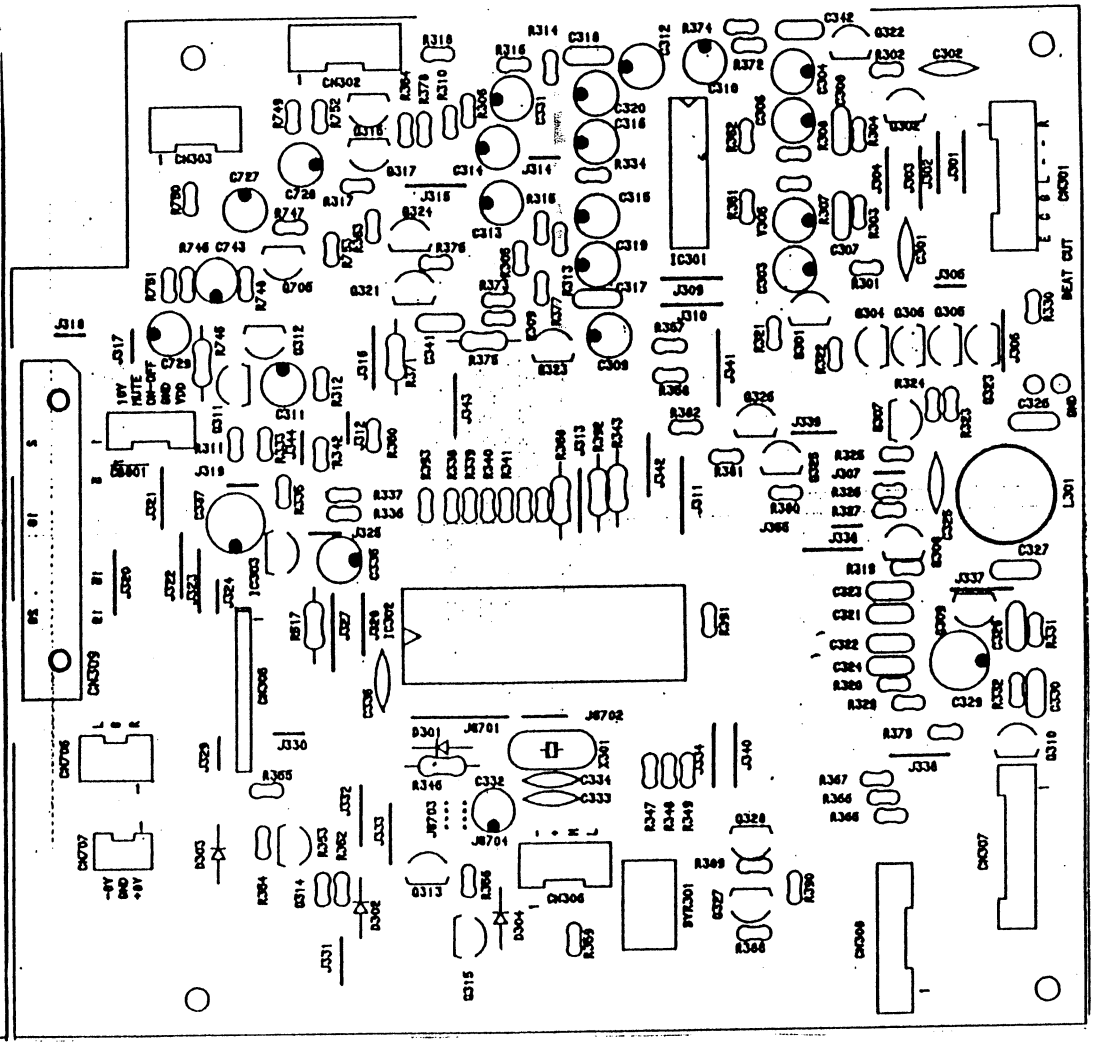
FUNTION PCB (BOTTOM VIEW)

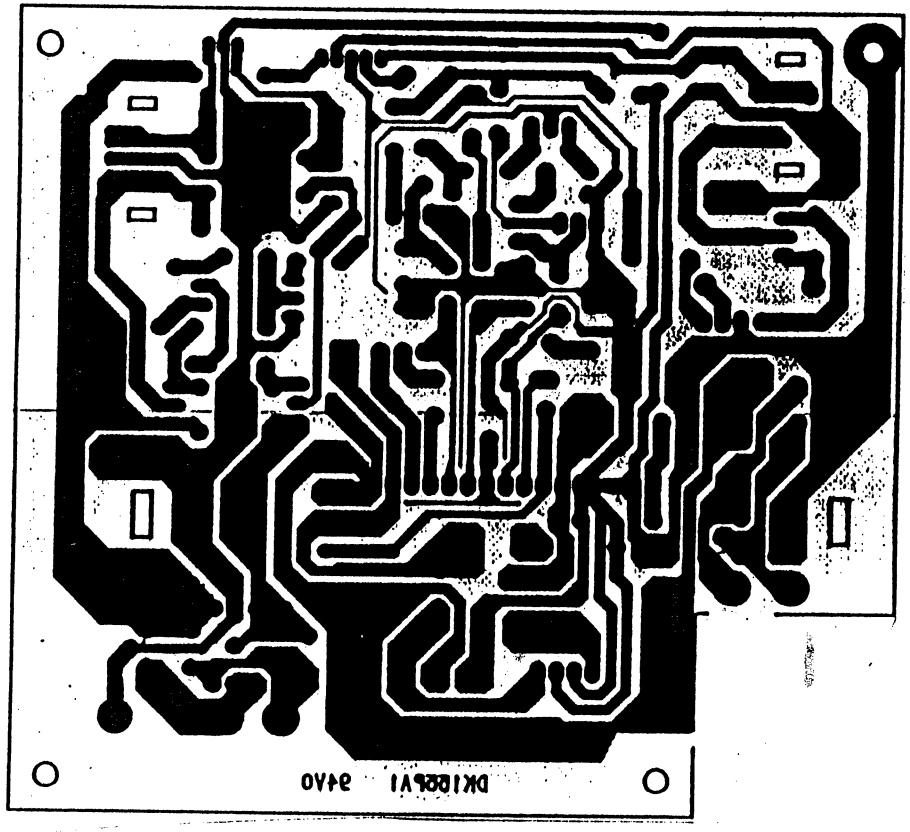
CASSETTE PCB (TOP VIEW)



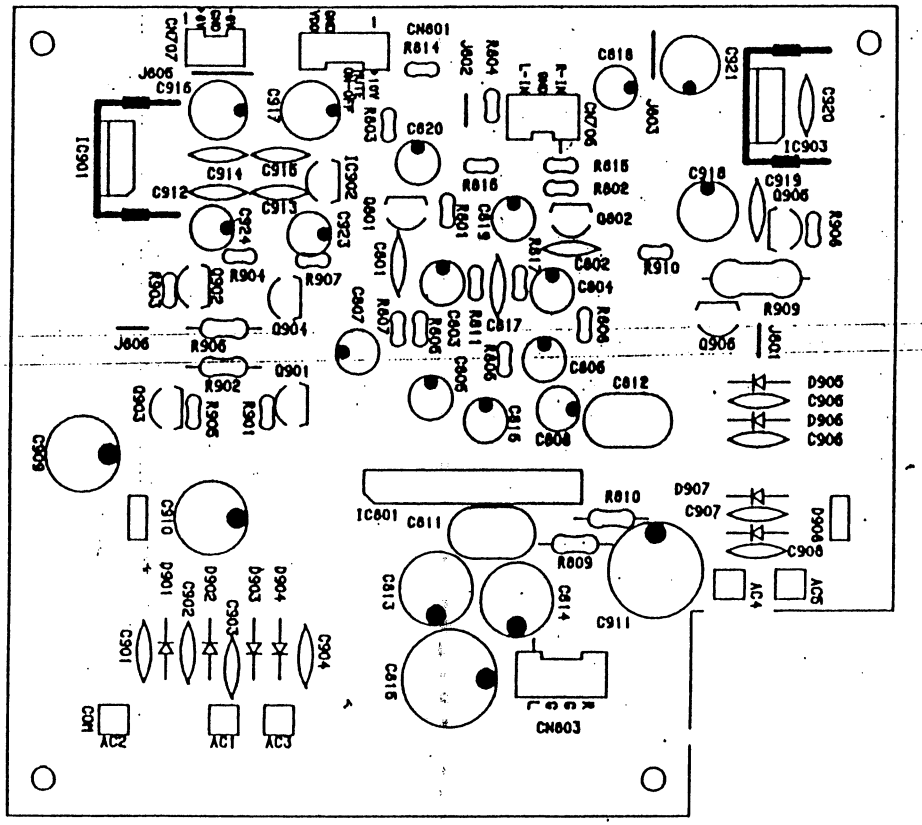
CASSETTE PCB (BOTTOM VIEW)



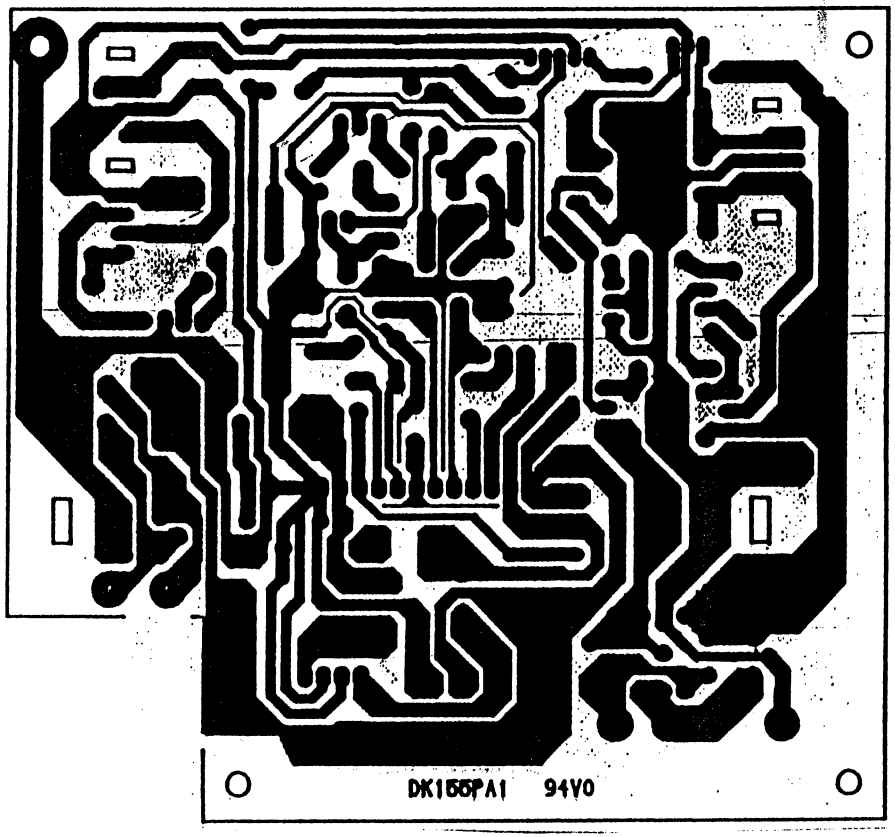


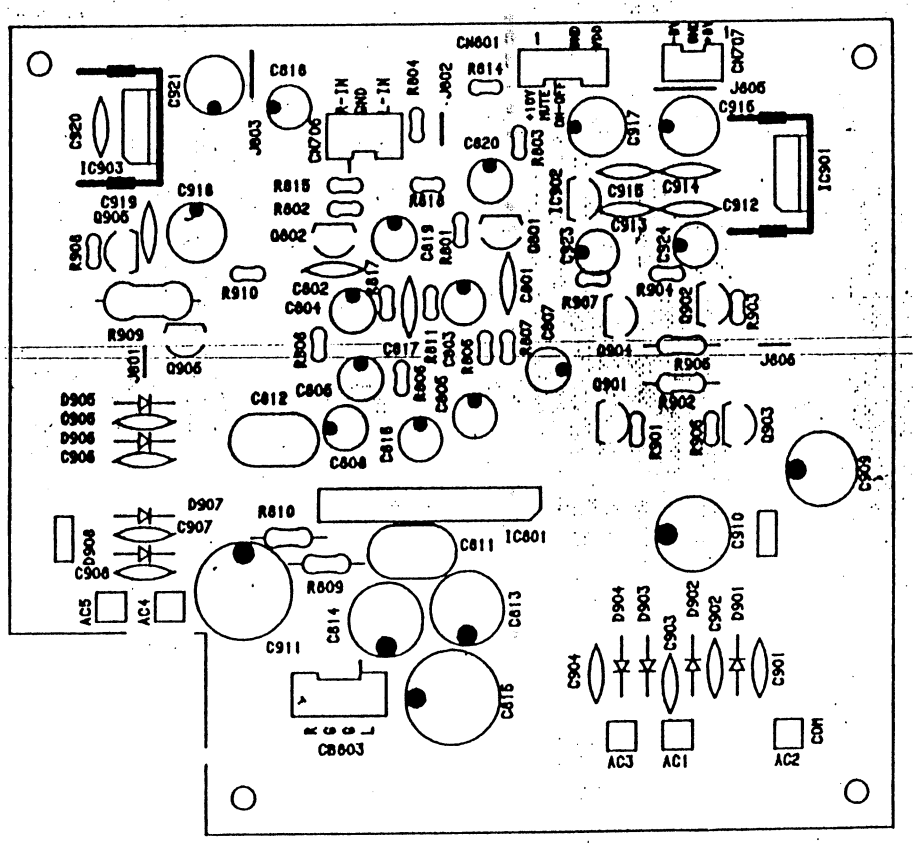


POWER AMP PCB (BOTTOM VIEW)

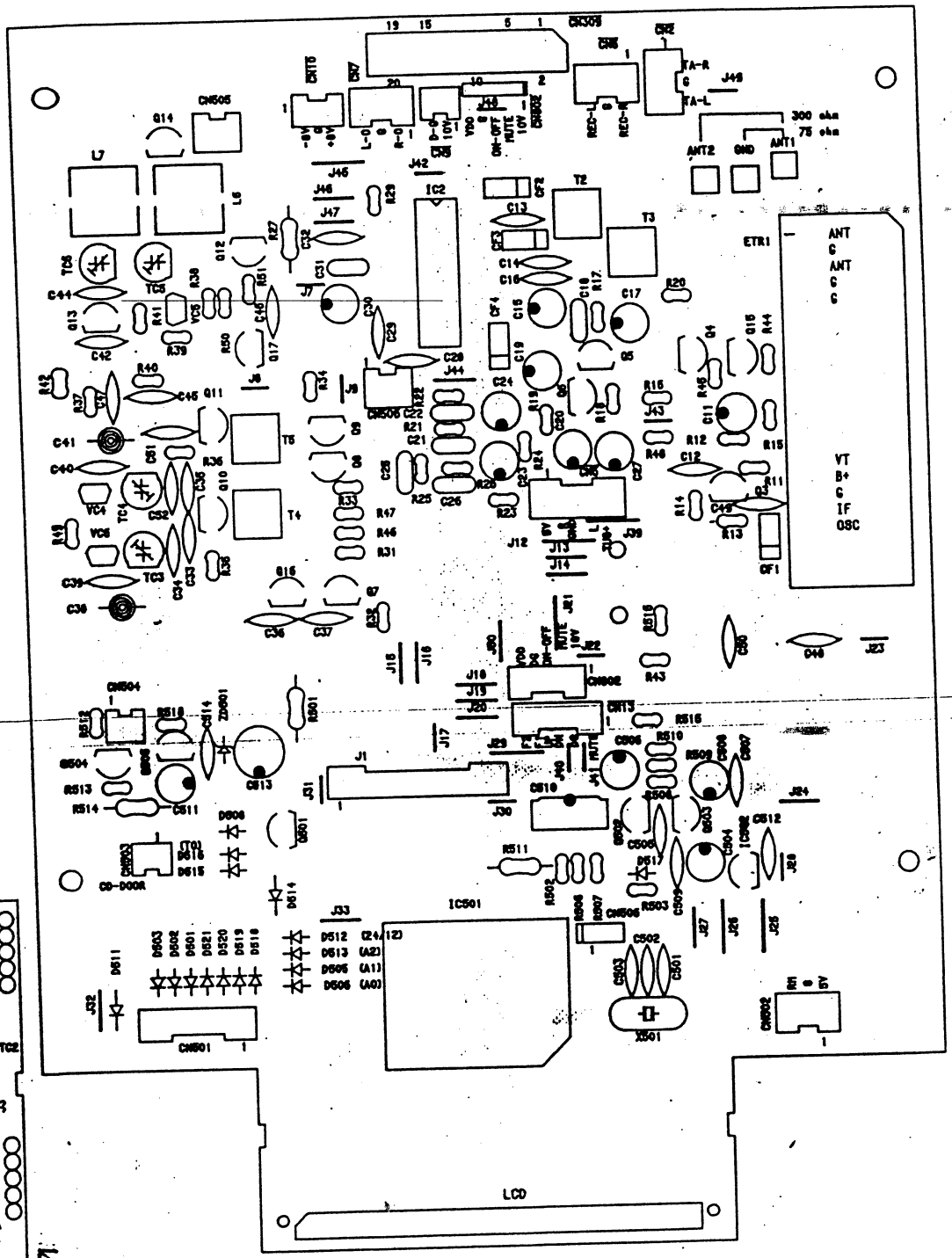


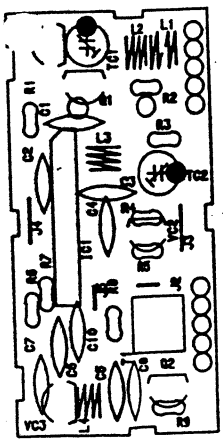
POWER AMP PCB (TOP VIEW)



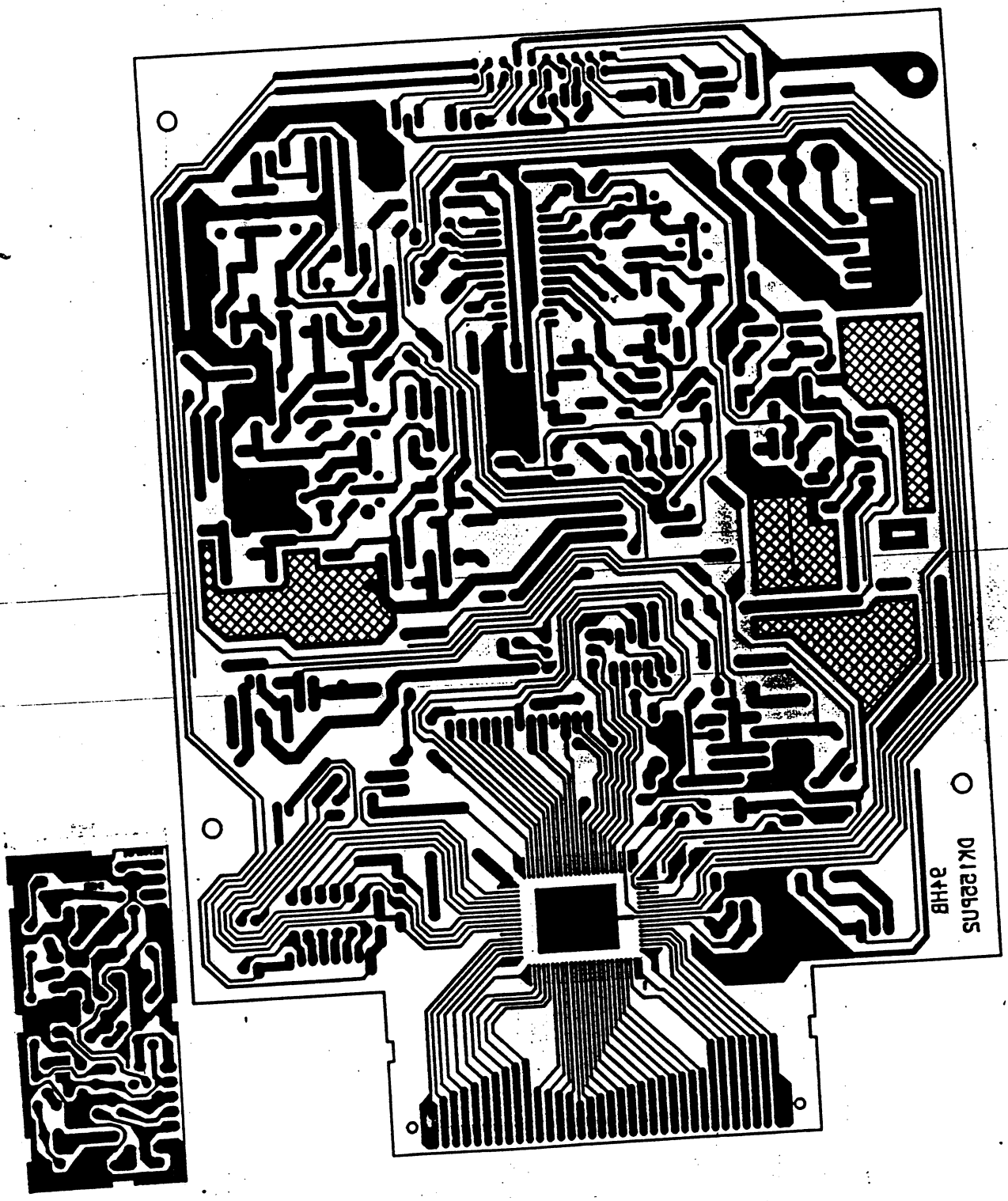


U'COM PCB (TOP VIEW)

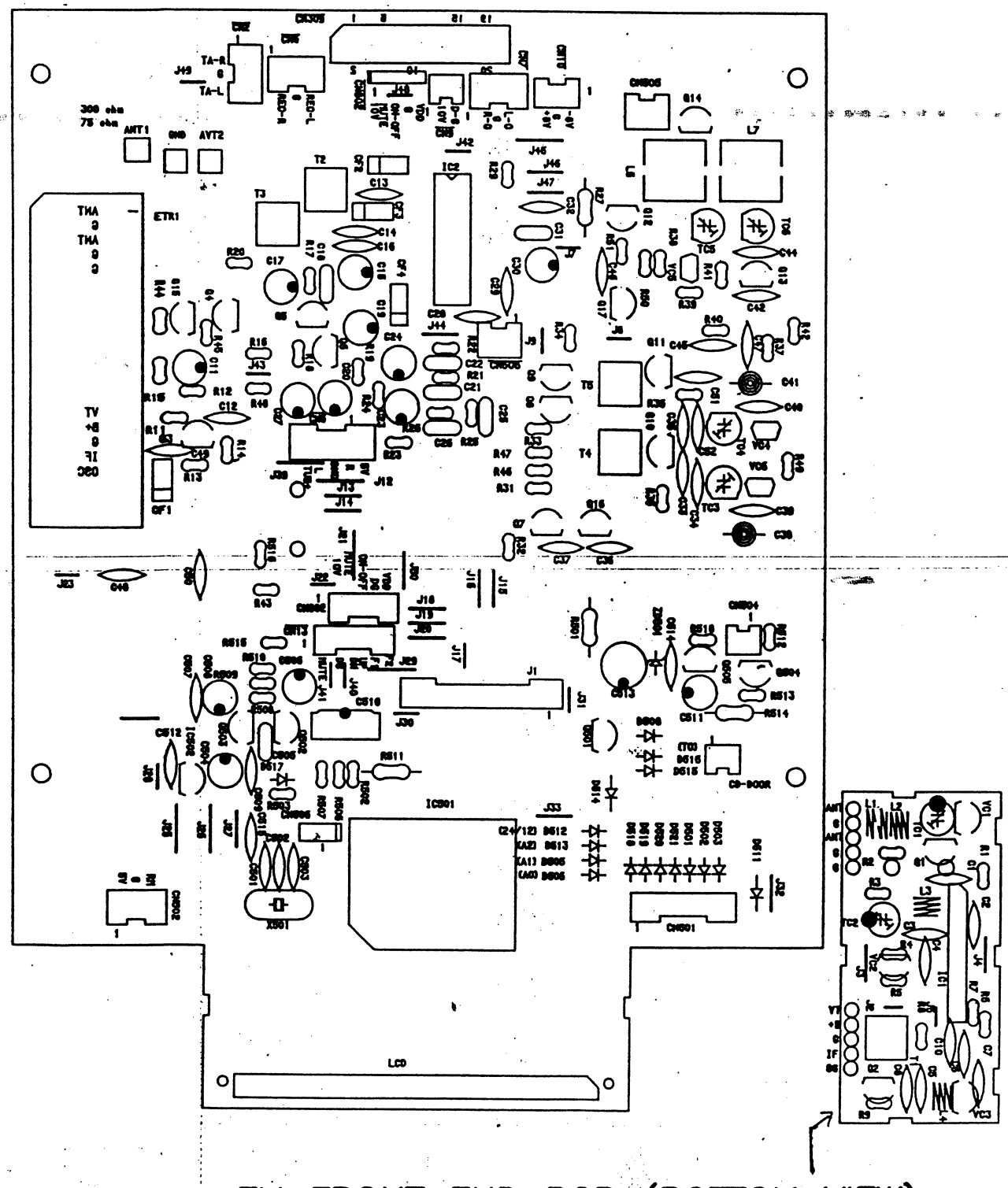




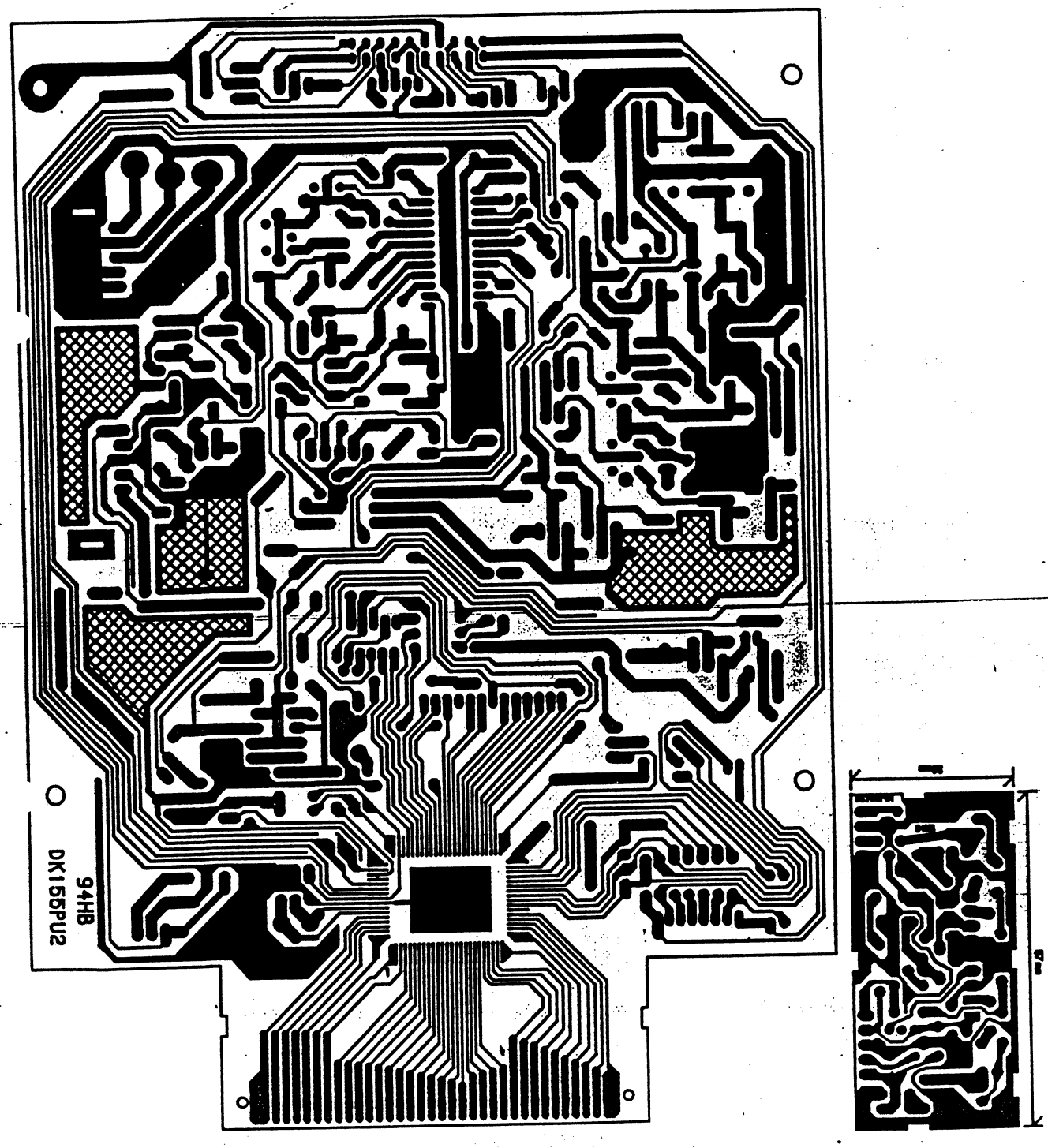
FM FRONT END PCB (TOP VIEW)


DK1552US
3+HB

U'COM PCB (BOTTOM VIEW)



FM FRONT END PCB (BOTTOM VIEW)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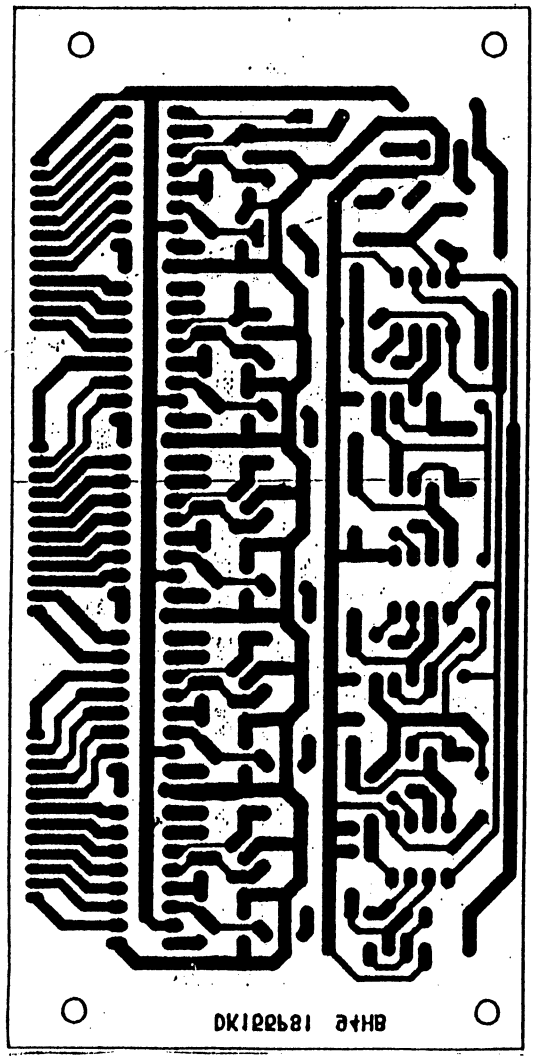
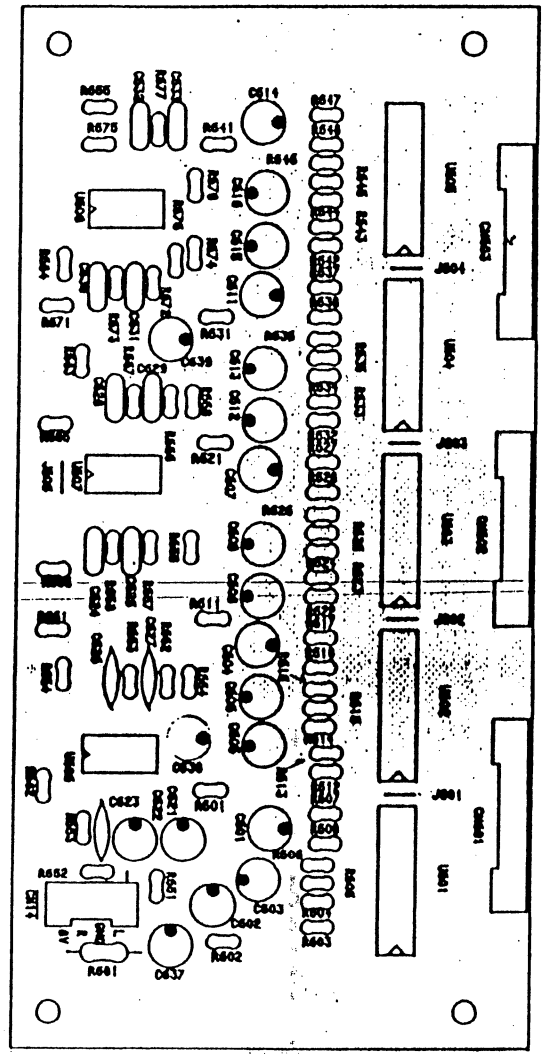
DK155PU2

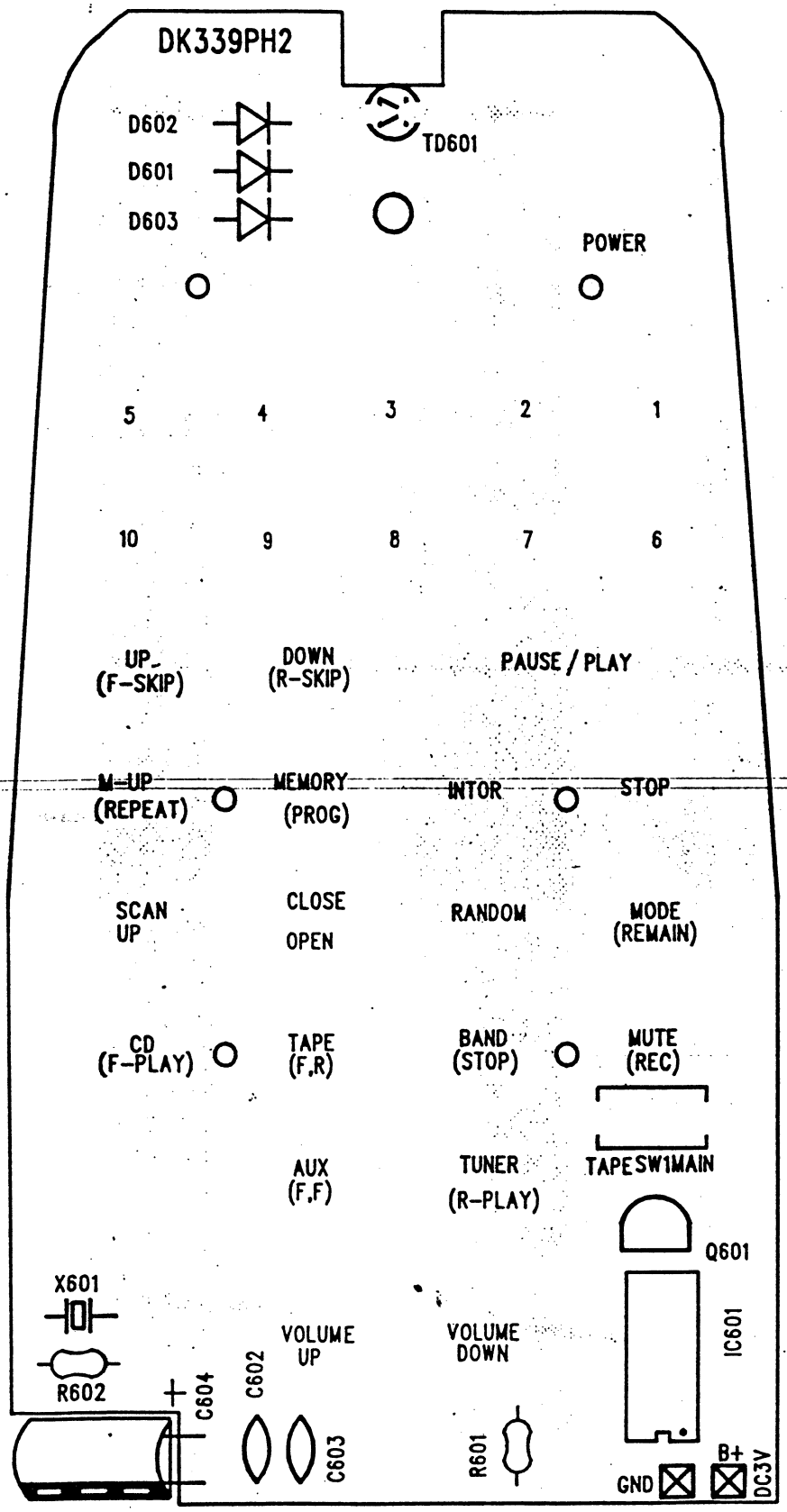


SPECTRUM PCB (TOP VIEW)

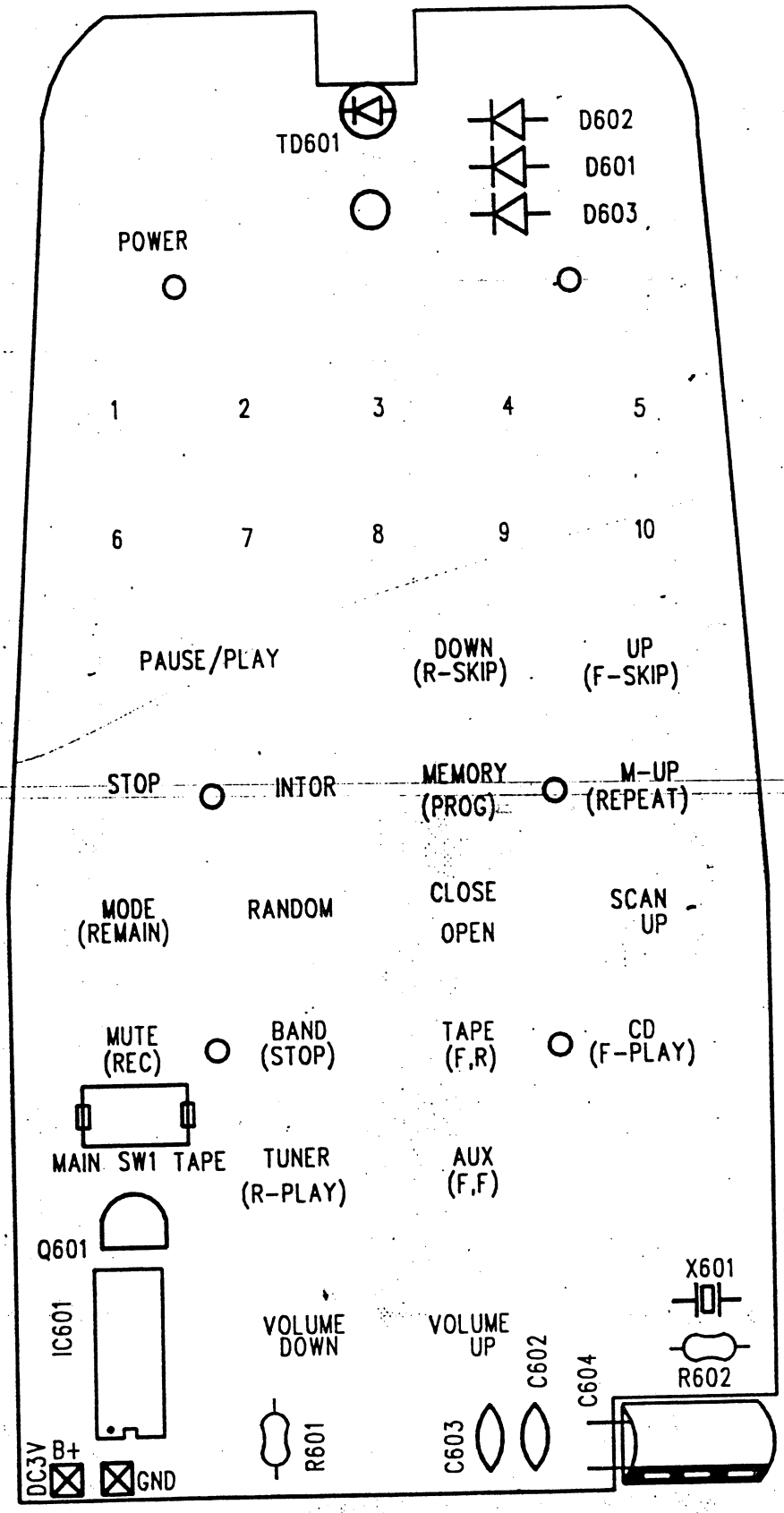


SPECTRUM PCB (BOTTOM VIEW)

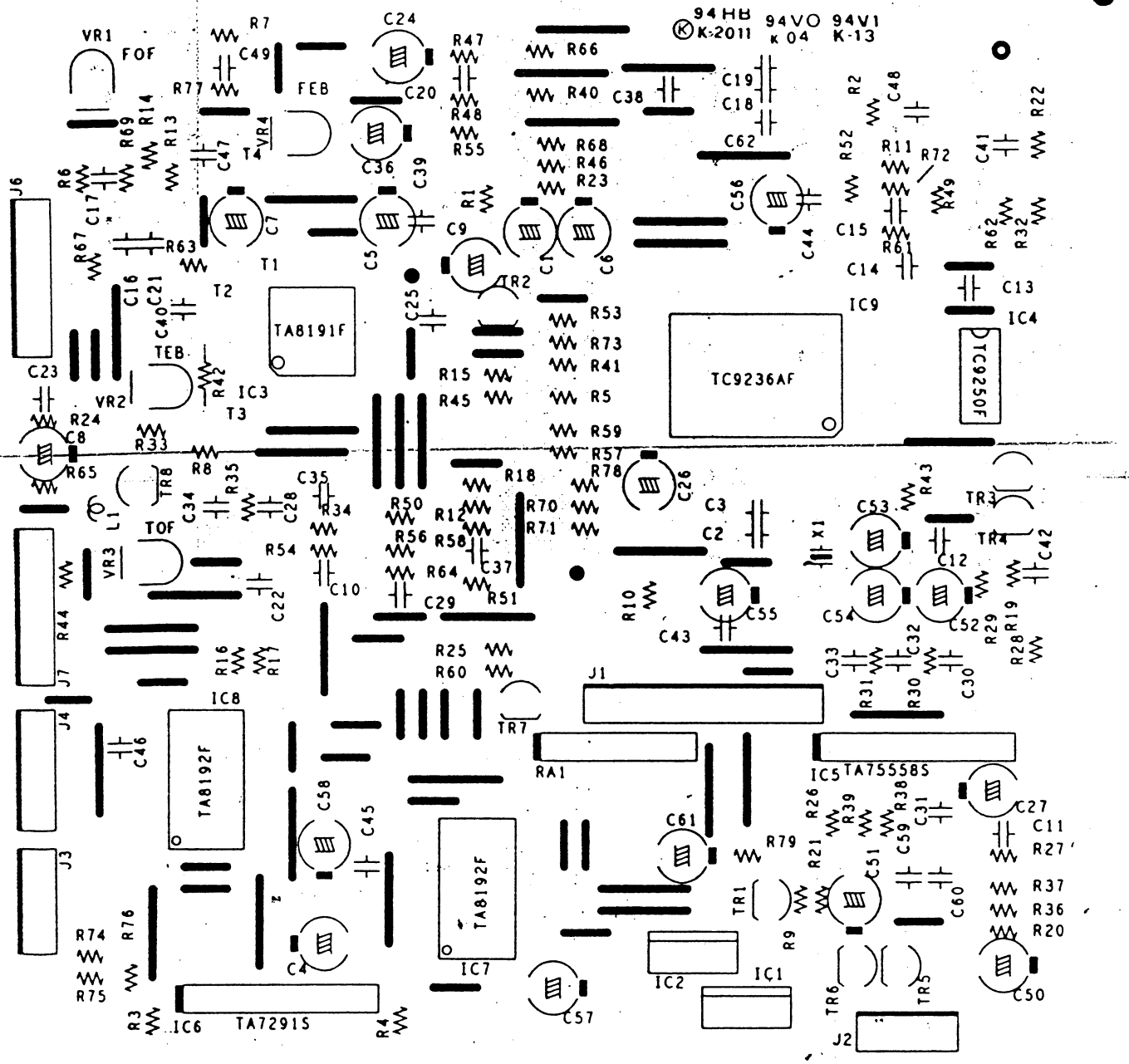
HANDSET PCB (TOP VIEW)

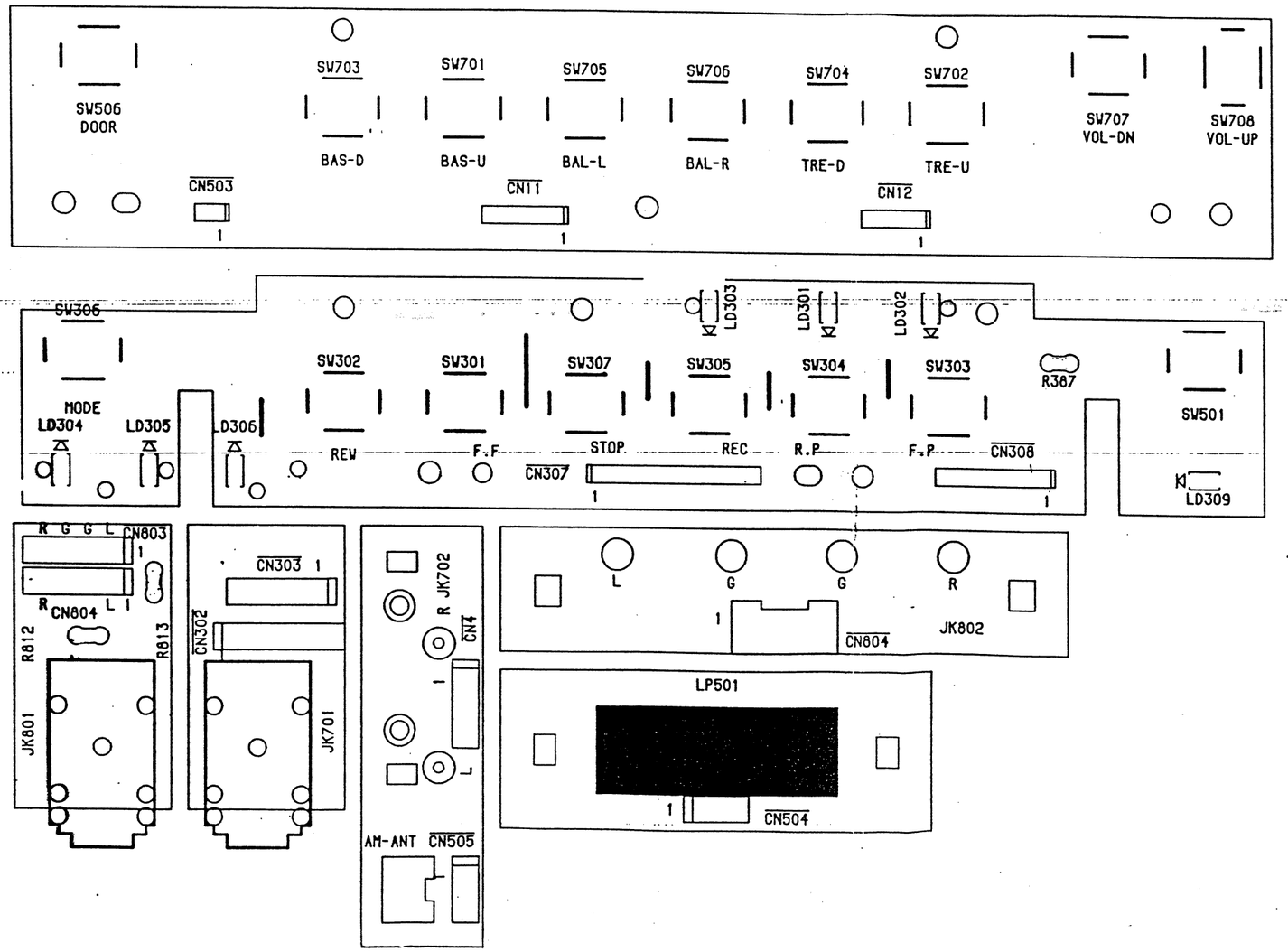


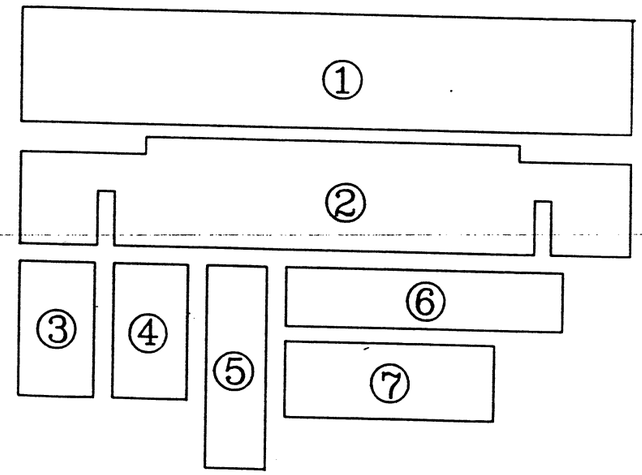
HANDSET PCB (BOTTOM VIEW)



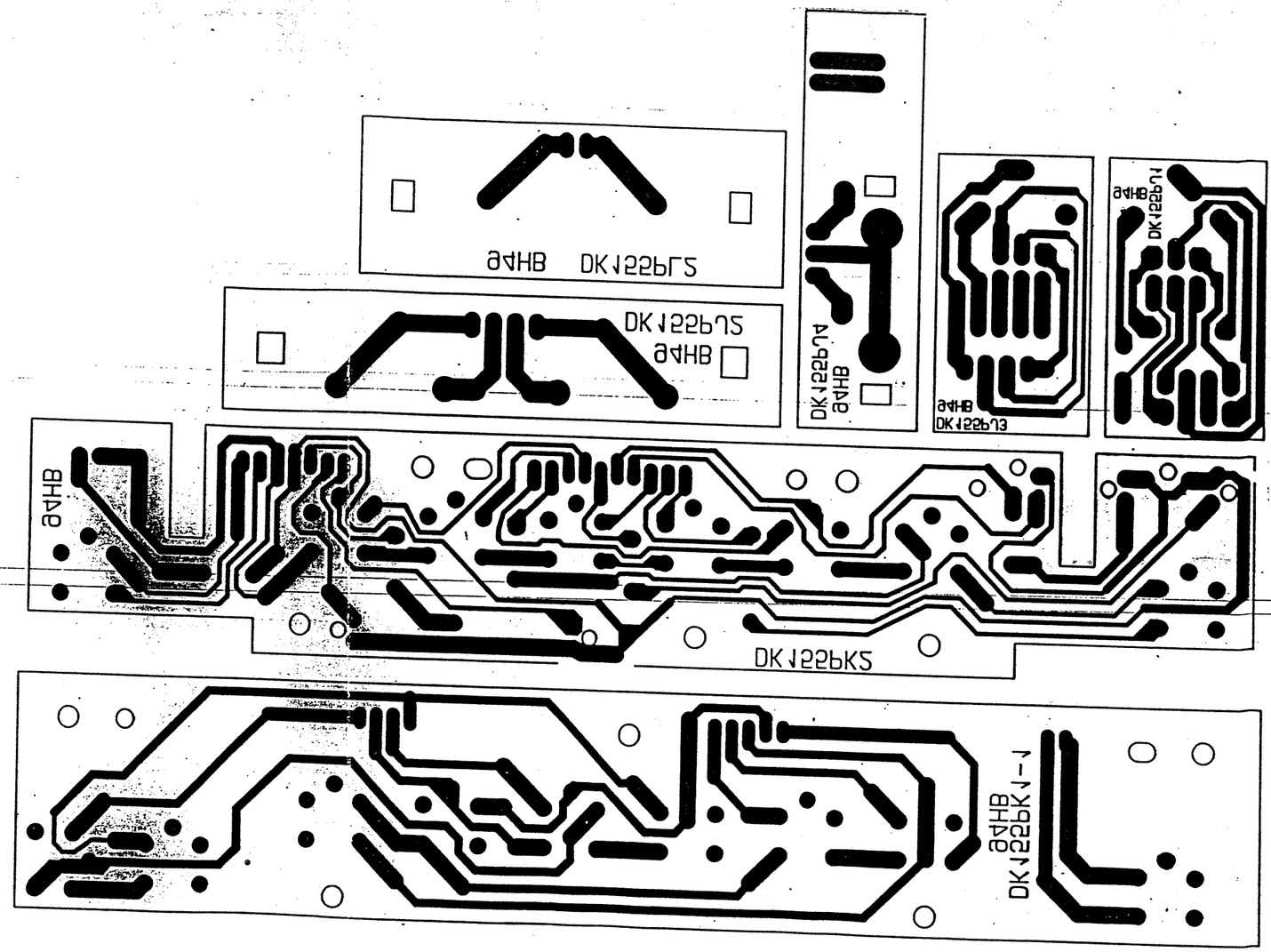
CD MAIN PCB (TOP VIEW)

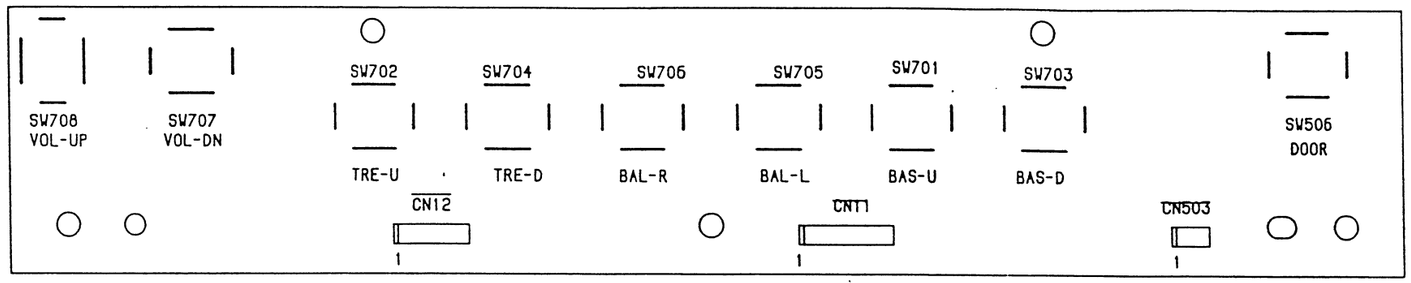


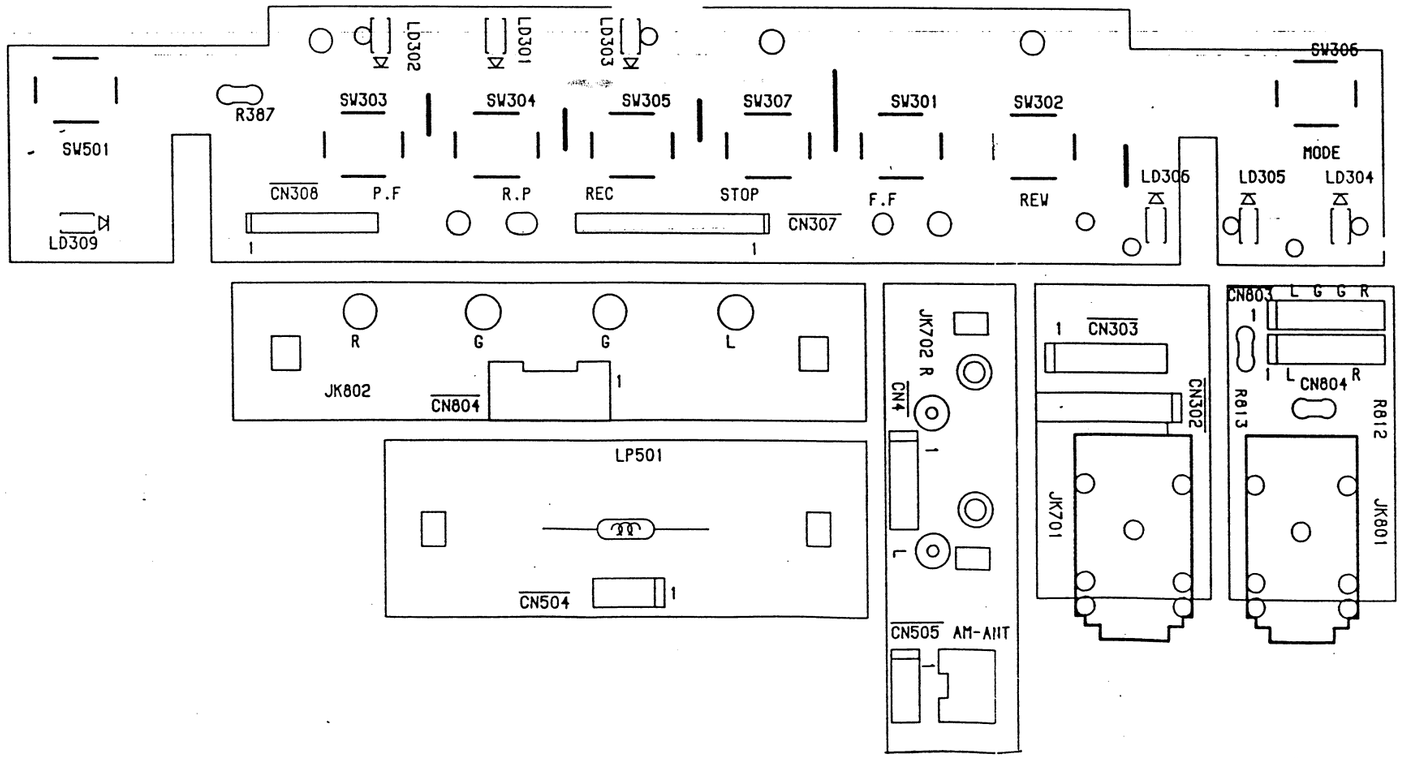


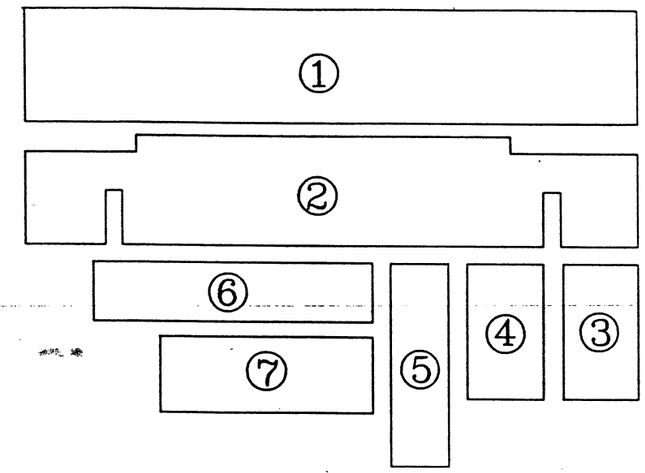


① VOL. TONE CONTROL PCB (TOP VIEW)
② KEY CONTROL PCB (TOP VIEW)
③ HEADPHONE PCB (TOP VIEW)
④ MICPHONE PCB (TOP VIEW)
⑤ AUX JACK PCB (TOP VIEW)
⑥ SPEAK JACK PCB (TOP VIEW)
⑦ LCD LAMP PCB (TOP VIEW)


DK1225K5
DK1225K1-1







① VOL. TONE CONTROL PCB (BOTTOM VIEW)

② KEY CONTROL PCB (BOTTOM VIEW)

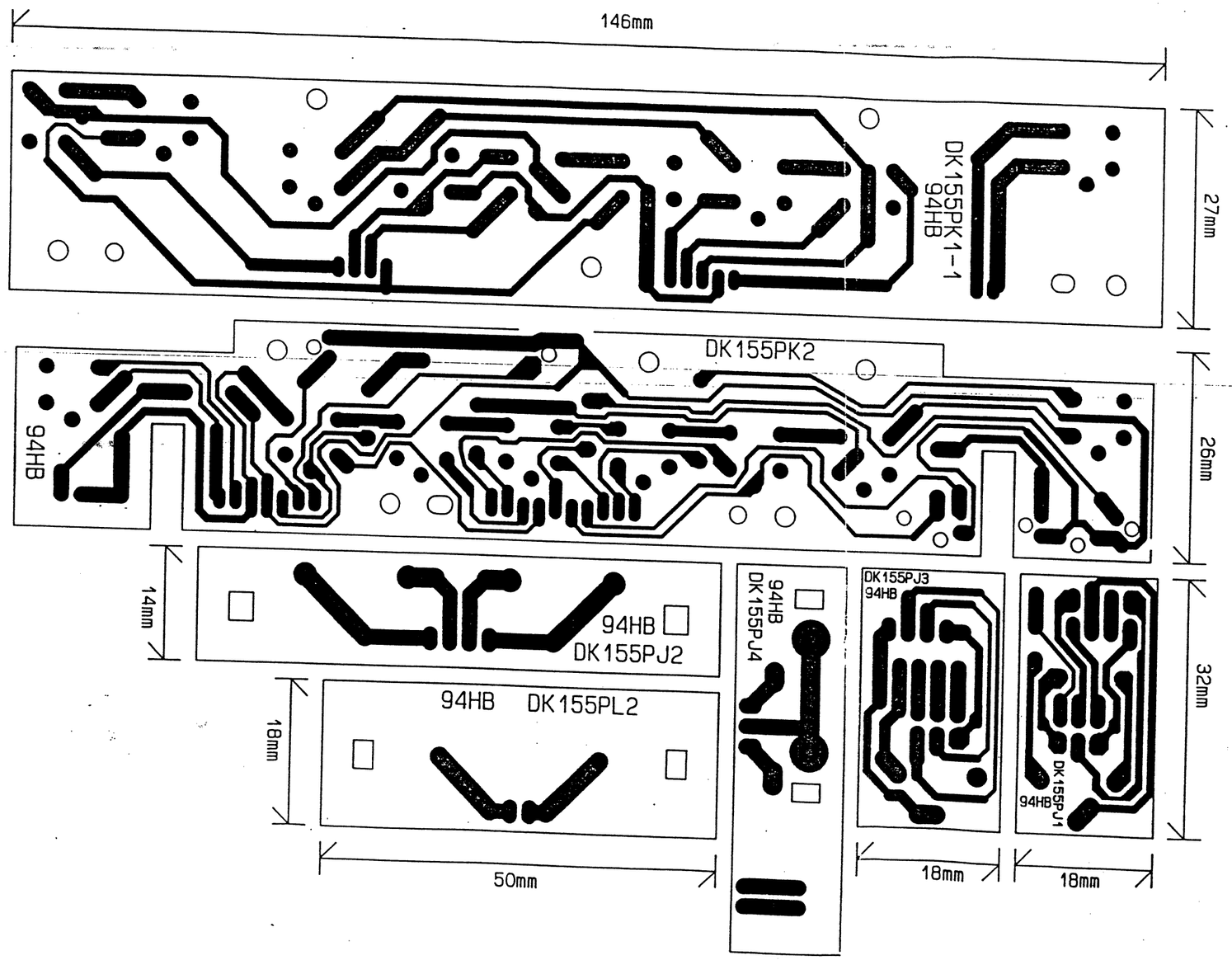
③ HEADPHONE PCB (BOTTOM VIEW)

④ MICPHONE PCB (BOTTOM VIEW)

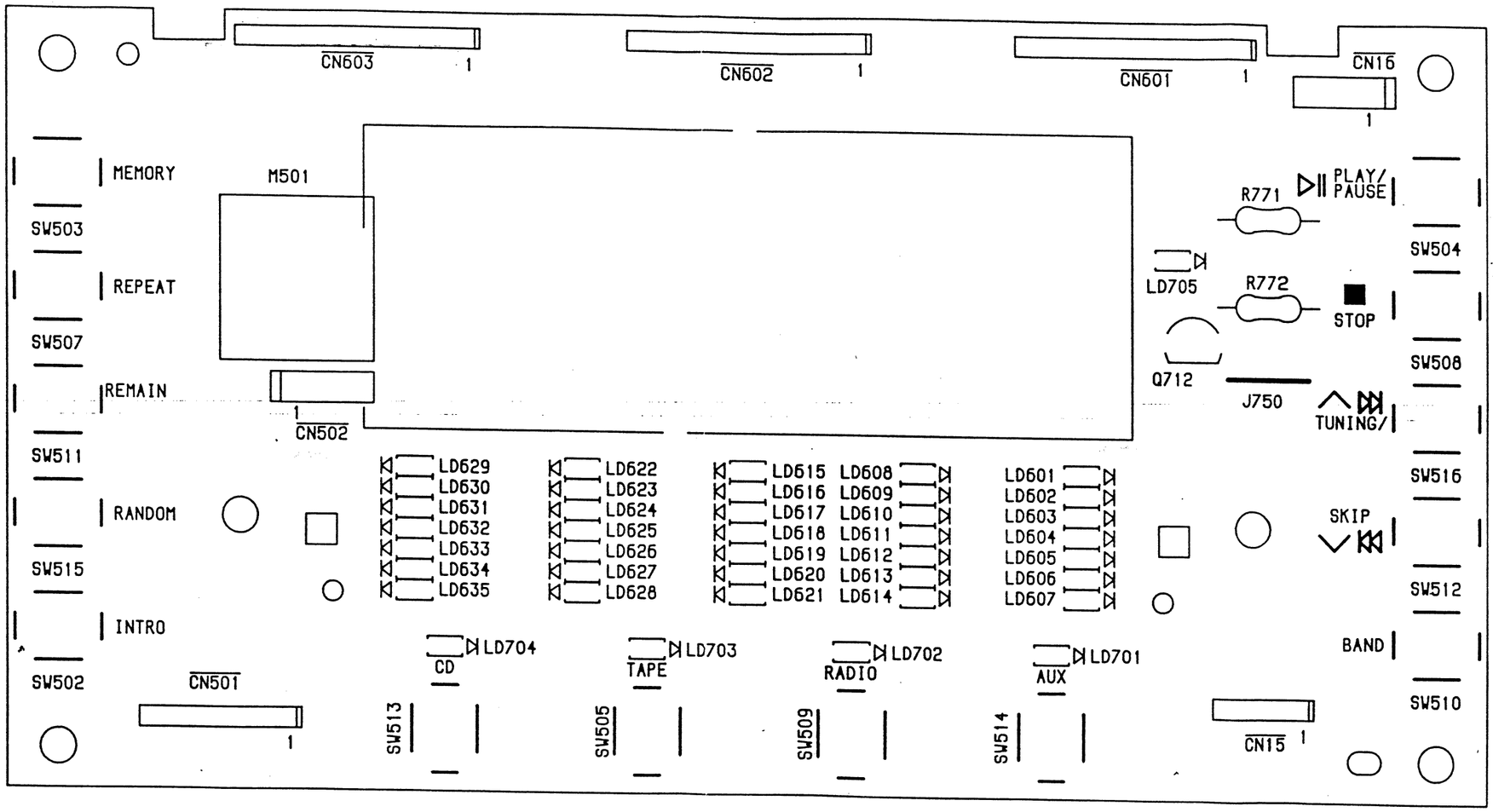
⑤ AUX JACK PCB (BOTTOM VIEW)

⑥ SPEAK JACK (BOTTOM VIEW)

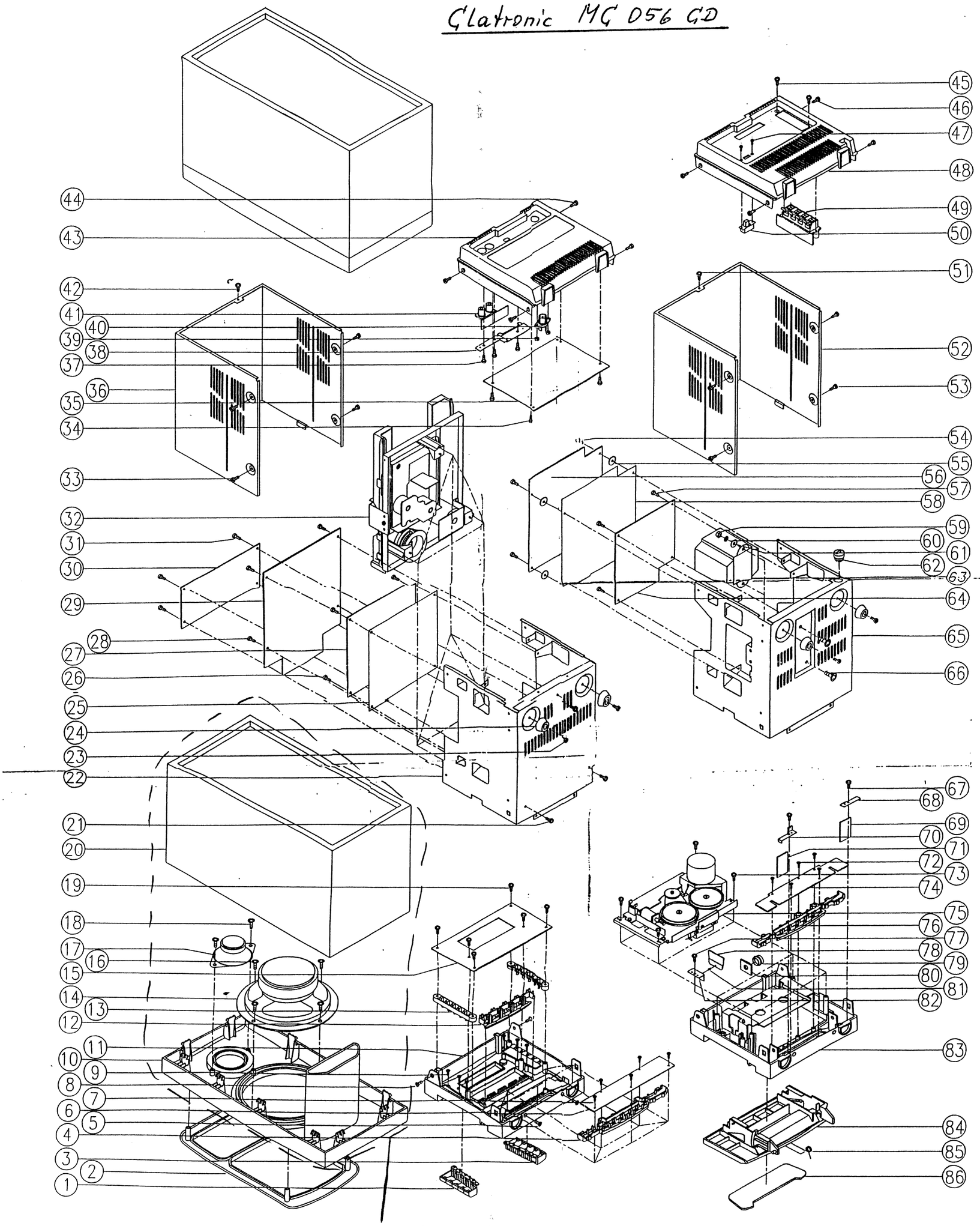
⑦ LCD LAMP PCB (BOTTOM VIEW)


146mm
27mm
DK155PK1-1
94HB
DK155PK2
94HB
26mm
14mm
94HB
DK155PJ2
94HB
DK155PJ4
DK155PJ3
94HB
32mm
18mm
94HB DK155PL2
DK155PJ1
94HB
50mm
18mm
18mm

CD & TUNE CONTROL KEY PCB
(TOP VIEW)



Clatronic MG 056 CD



Box nur komplett

PCB-608

IC4 TC9250F

IC9 TC9236AF

IC3 TA8191F

IC5 TA75558S

IC1 TA78005S

IC2 TA78005S

IC6 TA7291S

IC7 TA8192F FIM

IC8 TA8192F FIM

TR3 RN1210

TR4 RN1210

TR8 2SA1015

TR7 2SC2458

TR2 2SA1048

X1 8.46M

L1 100U

VR1 100K F0F

VR2 100K TEB

VR3 100K T0F

RA1 22Kx6

J1 GND CLT SLT

J2 +10V D-GND R GND L

J3 CLT GND

J4 DM- DM- FM- FM- SLT GND

J6 D C B A G K E F

J7

KOSONIC INDUSTRIES CO.,LTD.	
TITLE: SCHEMATIC DIAGRAM	
MODEL: CDK-155R	SHEET 1 OF 1
DESCRIPTION: CASSETTE PCB	REV: VER: 1
CODE FILE: 155-CASS	SIZE: D
DWN BY: LEUNG KIN WAI	DATE: 24-6-94

JK701 MICOMCNE

CN304 CN303 CN309 CN305 11PIN CN306 4PIN CN307 CN308 CN301

IC301 TAB1424AP

IC302 TC9314 KPU 1001

IC303 78L05

HALL IC

SOL-P2 SOL-P1

M

X301 3.57M

291-004

ERASE HEAD

R/P HEAD L R/P HEAD R

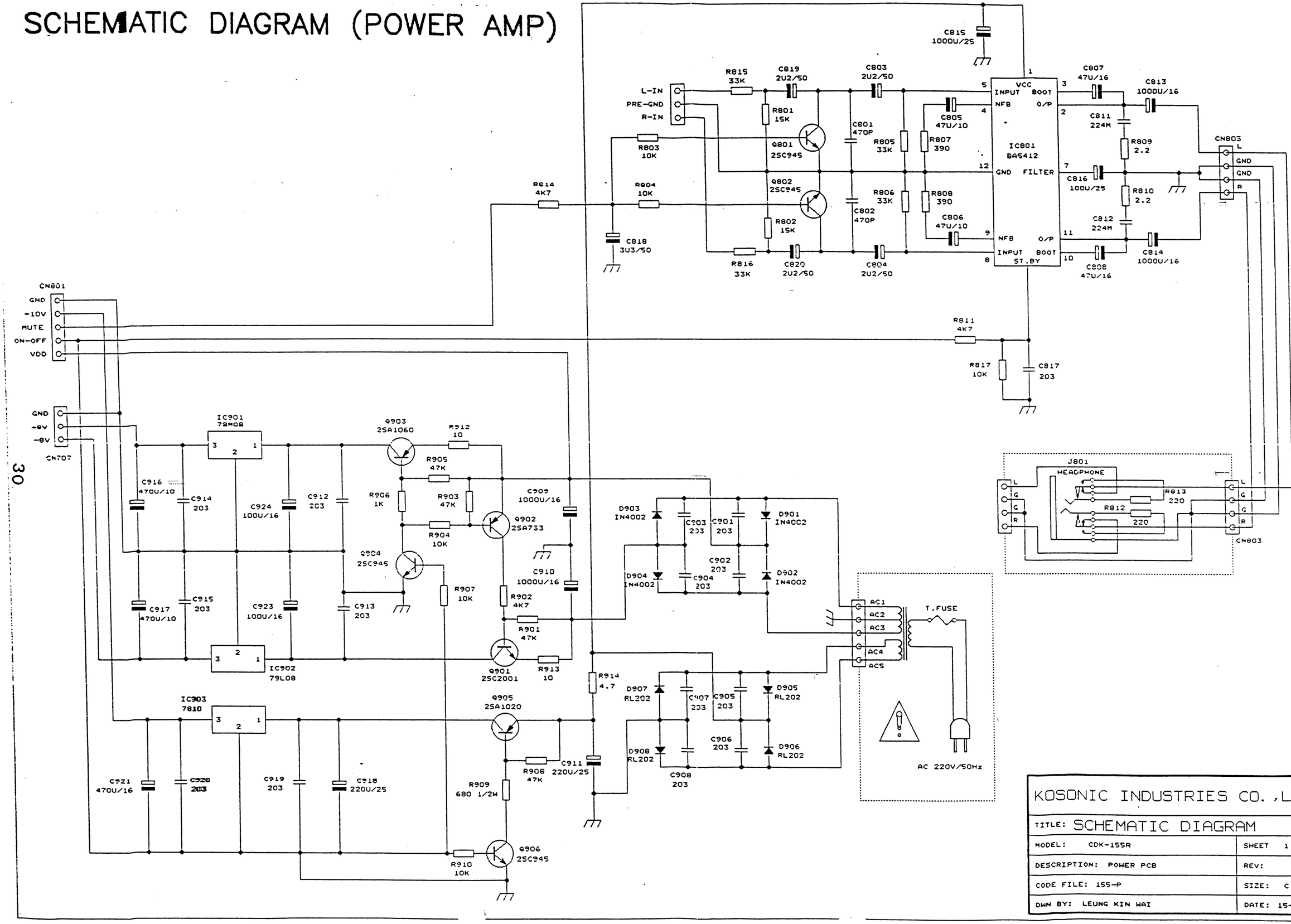
SW501 POWER
SW301 F.F
SW302 F.R
SW303 F-PLAY
SW304 R-PLAY
SW305 RECORD
SW306 MODE
SW307 STOP

LD309 POWER
LD301 R-PLAY
LD302 F-PLAY
LD303 REC
LD304 SINGLE
LD305 ONE CYCLE
LD306 CONTIN
LD308 CPC2
LD307

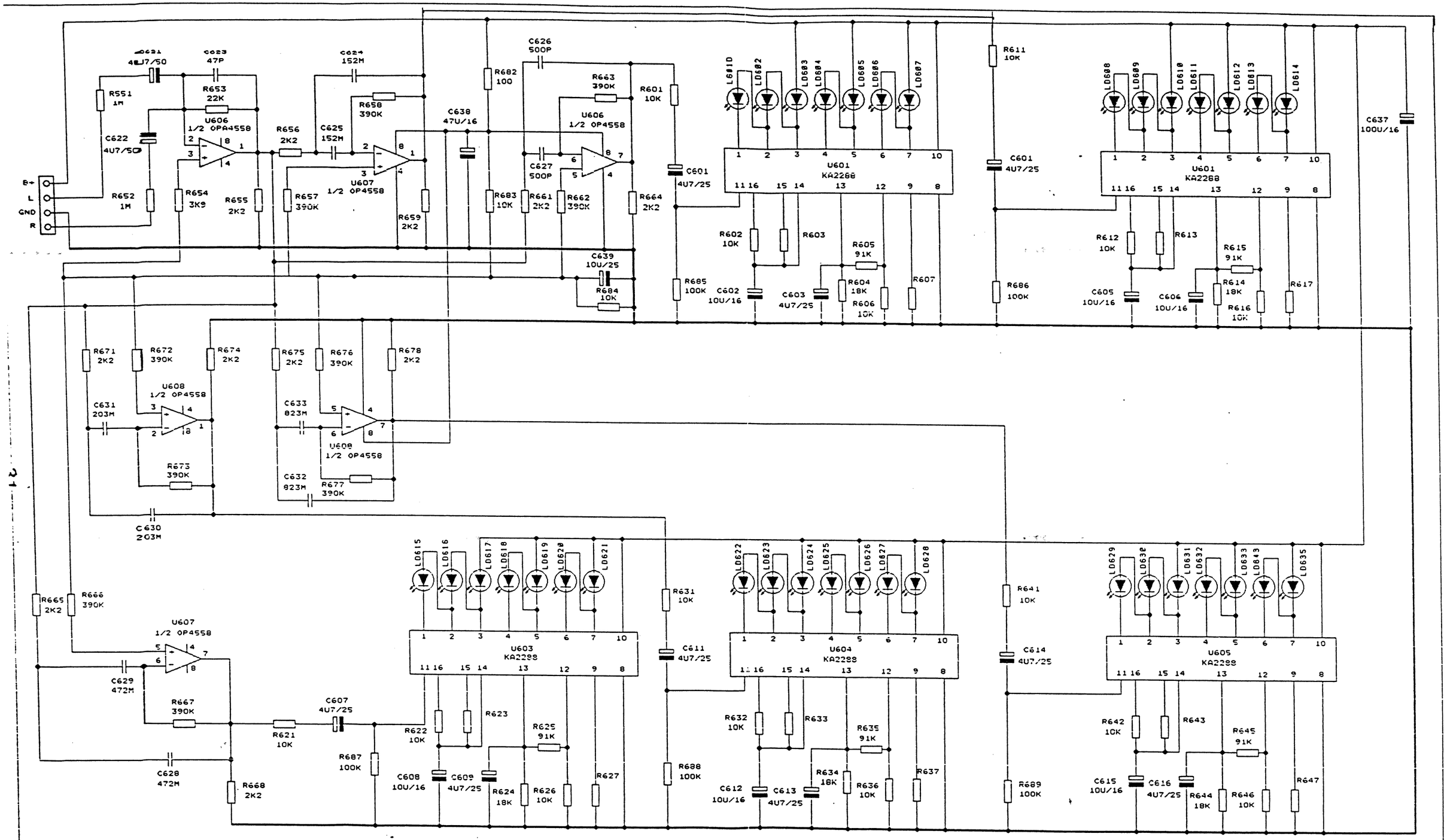
CD-R GND CD-L CN3
TA-R GND TA-L CN2
AUX-R GND AUX-L CN4
REC-L GND REC-R CN5
-8V
R765 10K
R766 10K
R702 56K
R703 4K7
R704 4K7
R701 56K
R784 47K
R783 47K
R706 56K
R708 10K
R707 10K
R705 56K
Q710 S2A733
R767 47K
R768 4K7
R769 47K
Q711 S2C945
R770 47K
Q708 2SC945
R763 47K
Q709 2SC945
R764 47K
CN6
TU-B+
TUNE-L
GND
TUNE-R
+5V
5V
IC701 4052BP
3Y 2X 1X 3X 0Y A B 0X
1Y 2Y Y-COM X-COM INH VSS VEE VDD
C704 4U7/25
C703 4U7/25
IC702 4052BP
VDD 2X 1X X-COM 0X 3X A B
0Y 2Y Y-COM 3Y 1Y INH VEE VSS
R709 1K
R710 1K
R711 1K
R712 1K
CN15
LD701 LD702 LD703 LD704
AUX TUNE TAPE CD
Q907 2SA1020
C922 220U/16
CN9 +10V D-GND
R911 390
R912 47K
Q908 2SC945
R913 10K
R914 100K
CN8 CD+10V D-GND
IC708 1/2 4558
C734 4U7/25
C722 4U7/25
C724 4U7/25
C734 4U7/25
R742 1K
C726 4U7/25
CN7 R-O GND L-O
Q706 2SC945
R758 10K
C732 3U3/25
Q707 2SC945
R757 10K
R756 10K
R760 220K
R759 220K
IC708 1/2 4558
IC706 TC9176P
VDD R-OUT1 R-IN1 R-GND R-IN2 R-OUT2 ST DATA
VSS L-OUT1 L-IN1 L-GND L-IN2 L-OUT2 GND CK
C733 4U7/25
C721 4U7/25
C735 4U7/25
C723 4U7/25
R741 1K
C725 4U7/25
C715 4U7/25
R735 100K
R737 33K
D703 IN4148
D701 IN4148
IC703 TC9169AP
VDD L-3 L-1 L-2 INH NC OSC U/D
R-1 R-3 NC R-2 NC NC VSS DCO
C717 2U2/25
CN11
SW701 UP
SW703 DOWN
BASS
J713 100
CN14
R739 220
C719 100U/10
R717 4K7
R715 1M
C707 4U7/25
Q701 2SC945
C705 4U7/25
C709 4U7/25
R713 47K
R719 1K2
R721 47K
R723 5K6
C741 473M
C711 473M
R729 10K
R725 100
R727 8K2
C739 150P
C713 562M
IC705 1/2 4558
R733 8K2
R731 6K8
R724 5K6
C742 473M
C712 473M
R730 10K
R734 8K2
C740 150P
R728 8K2
C714 562M
IC705 1/2 4558
C730 47U/10
R754 1K
C731 47U/10
R755 1K
R718 4K7
R716 1M
C708 4U7/25
Q702 2SC945
C706 4U7/25
C710 4U7/25
R714 47K
R720 1K2
R722 47K
R726 100
C716 4U7/25
R738 33K
R732 6K8
R736 100K
D702 IN4148
D704 IN4148
IC704 TC9169AP
VDD R-3 R-1 R-2 INH NC OCS U/D
L-1 L-3 NC L-2 NC NC VSS DCO
C718 2U2/25
CN11
SW702 UP
SW704 DOWN
TREBLE
5V
R790 10
C736 100U/10
IC707 TC9185P
VDD CK DATA STS A B C D E F
GND OSC INH K1 K2 T4 T3 T2 T1 S
R761 47K
R762 47K
R740 47K
C720 220P
CN16
P771 470
R772 4K7
LD705 BALANCE CENTER
Q712 2SC945
D706 IN4148
D707 IN4148
R791 2K2
R792 2K2
C745 820P
C746 820P
CN12
SW706 L-CH
SW705 R-CH
SW707 DOWN
S708W UP
Q704 2SC945
Q703 2SC945
CN10 +8V GND -8V
R743 470K
R744 470K
CN13 F2 F1 DN GND UP VOL

KOSONIC INDUSTRIES CO. LTD.	
TITLE: SCHEMATIC DIAGRAM	
MODEL: CDK-155R	SHEET 1 OF 1
DESCRIPTION: FUNTION PCB	REV: VER: 1
CODE FILE: 155-FUN	SIZE: D
DWN BY: LEUNG KIN WAI	DATE: 21-6-94

SCHEMATIC DIAGRAM (POWER AMP)

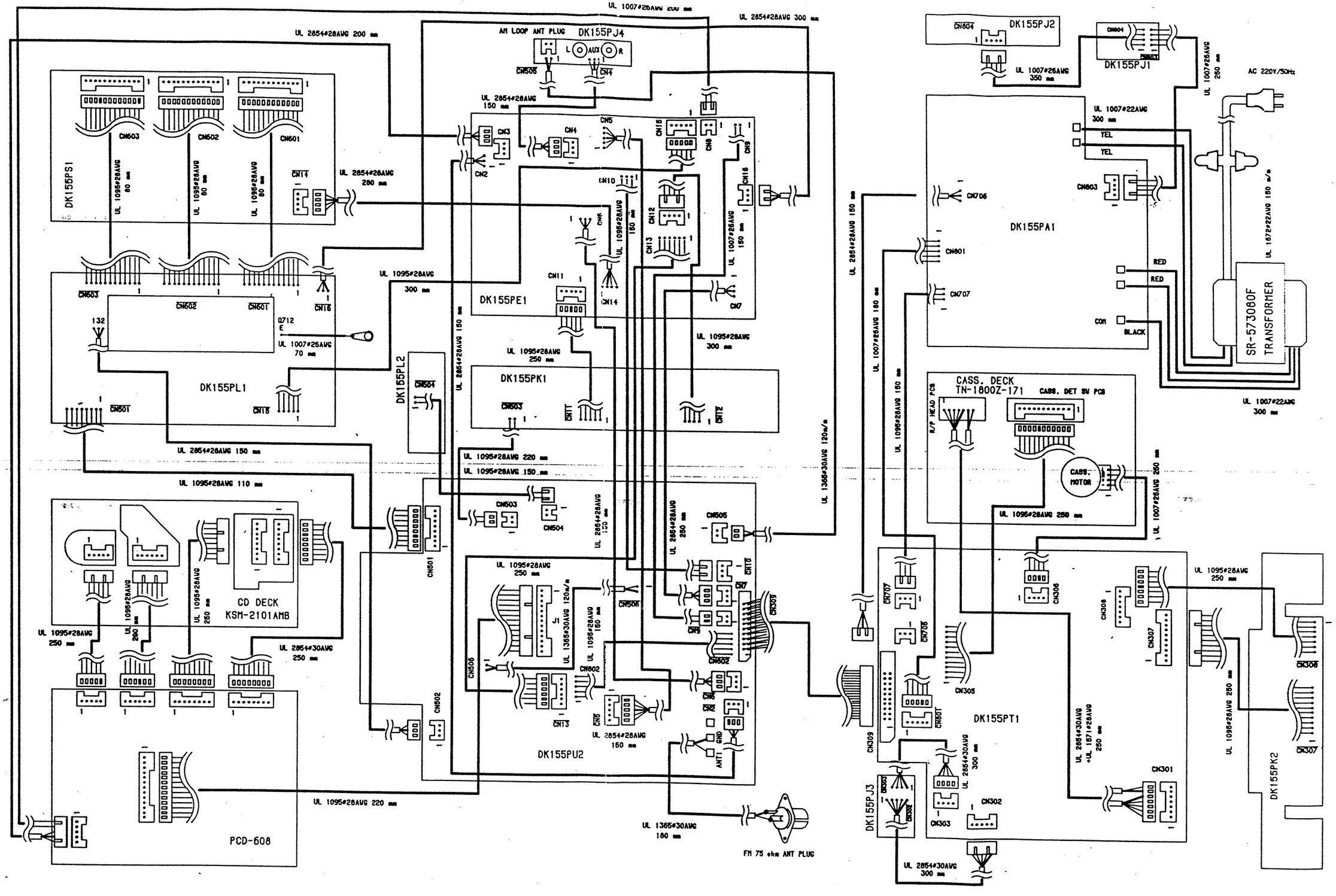


KOSONIC INDUSTRIES CO. ,LTD.	
TITLE: SCHEMATIC DIAGRAM	
MODEL: CDK-155R	SHEET 1 OF 1
DESCRIPTION: POWER PCB	REV: VER: 1
CODE FILE: 155-P	SIZE: C
DWN BY: LEUNG KIN WAI	DATE: 15-6-94

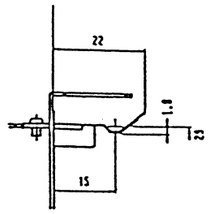


SCHEMATIC DIAGRAM (SPECTRUM)

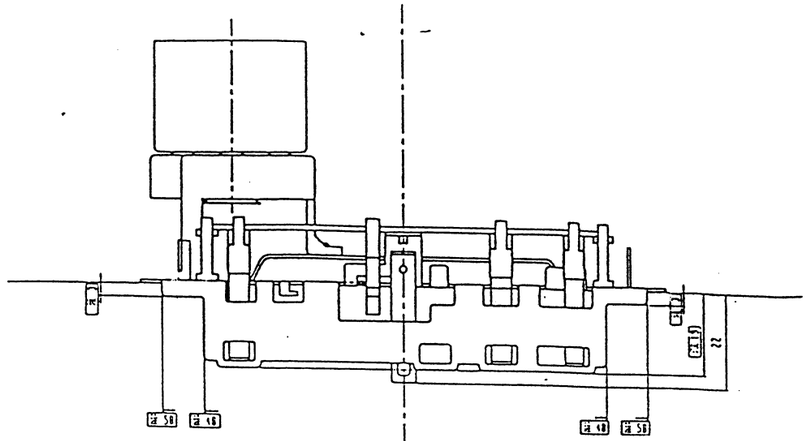
KOSONIC INDUSTRIES CO. ,LTD.	
TITLE: SCHEMATIC DIAGRAM	
MODEL: CDK-155R	SHEET 1 OF 1
DESCRIPTION: SPECTRUM PCB	REV: VER: 1
CODE FILE: 155-LED	SIZE: C
DWN BY: LEUNG KIN WAI	DATE: 16-6-94

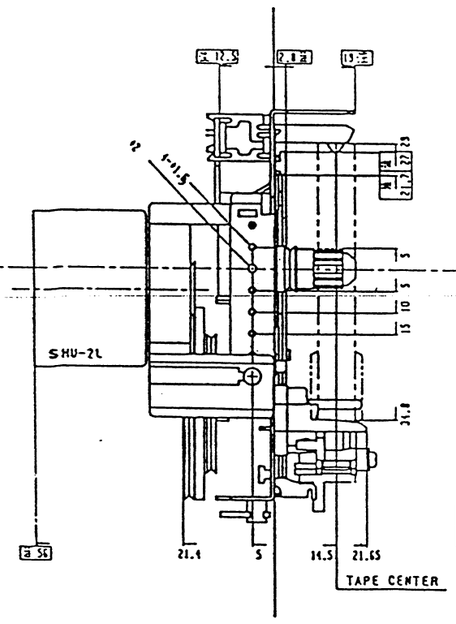

DK155PS1
DK155PL1
DK155PL2
DK155PE1
DK155PK1
DK155PU2
DK155PA1
DK155PT1
DK155PJ1
DK155PJ2
DK155PJ3
DK155PK2
AM LOOP ANT PLUG
FM 75 ohm ANT PLUG
CD DECK
KSM-2101AMB
PCD-608
CASS. DECK
TN-1800Z-171
CASS. DET SW PCB
R/P HEAD PCB
CASS. MOTOR
SR-573080F
TRANSFORMER
AC 220V/50Hz
UL 2854#28AWG 200 mm
UL 2854#28AWG 300 mm
UL 2854#28AWG 150 mm
UL 2854#28AWG 280 mm
UL 1095#28AWG 300 mm
UL 1095#28AWG 250 mm
UL 1095#28AWG 220 mm
UL 1095#28AWG 110 mm
UL 1095#28AWG 250 mm
UL 2854#28AWG 150 mm
UL 1007#28AWG 70 mm
UL 1095#28AWG 80 mm
UL 1095#28AWG 260 mm
UL 1095#28AWG 160 mm
UL 1095#28AWG 150 mm
UL 1095#28AWG 120m/m
UL 1365#30AWG 120m/m
UL 2854#28AWG 250 mm
UL 2854#30AWG 250 mm
UL 1365#30AWG 160 mm
UL 2854#28AWG 160 mm
UL 1095#28AWG 220 mm
UL 1007#26AWG 350 mm
UL 1007#26AWG 250 mm
UL 1007#22AWG 300 mm
UL 1672#22AWG 150 m/m
UL 2854#28AWG 180 mm
UL 2854#30AWG 300 mm
UL 2854#30AWG 280 mm
UL 2854#30AWG 300 mm
UL 1095#28AWG 280 mm
UL 1007#26AWG 260 mm
UL 1007#26AWG 150 mm
UL 1095#28AWG 150 mm
UL 1095#28AWG 260 mm
UL 1007#26AWG 180 mm
UL 1095#28AWG 250 mm
UL 1095#28AWG 280 mm
UL 1007#22AWG 300 mm
UL 2854#30AWG +UL 1671#28AWG 280 mm
YEL
YEL
RED
RED
COM
BLACK
CN501
CN502
CN503
CN504
CN505
CN506
CN601
CN602
CN603
CN604
CN701
CN702
CN703
CN704
CN705
CN706
CN707
CN801
CN802
CN803
CN804
CN301
CN302
CN303
CN305
CN306
CN307
CN308
CN309

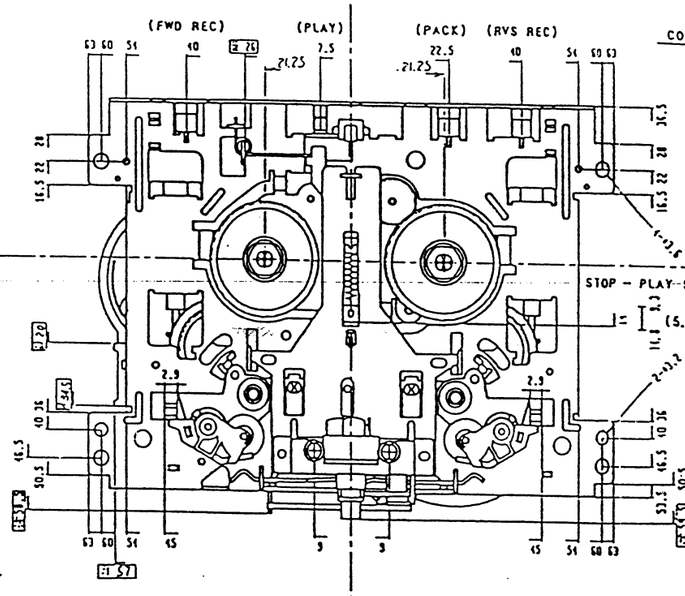
CASSETTE DECK DIMENSIONS DRAWING

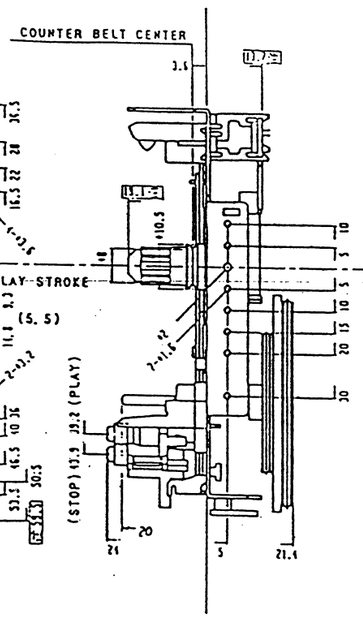


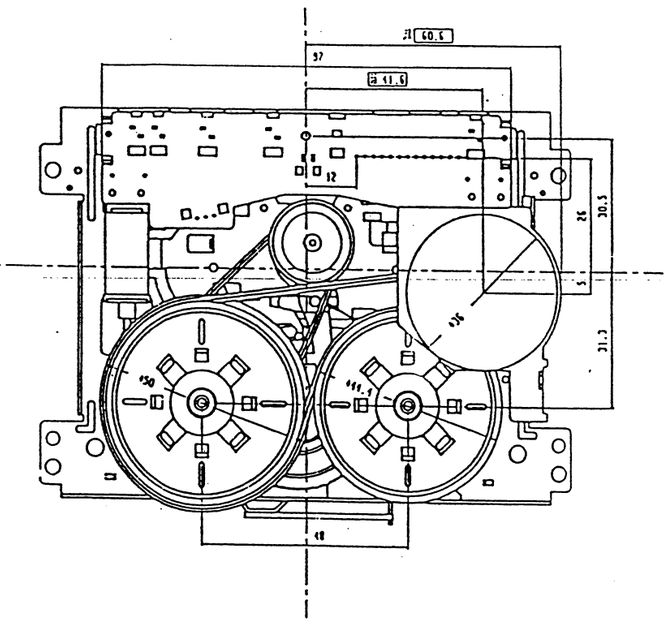
PACK SPRING PLATE

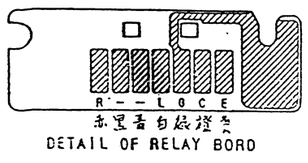




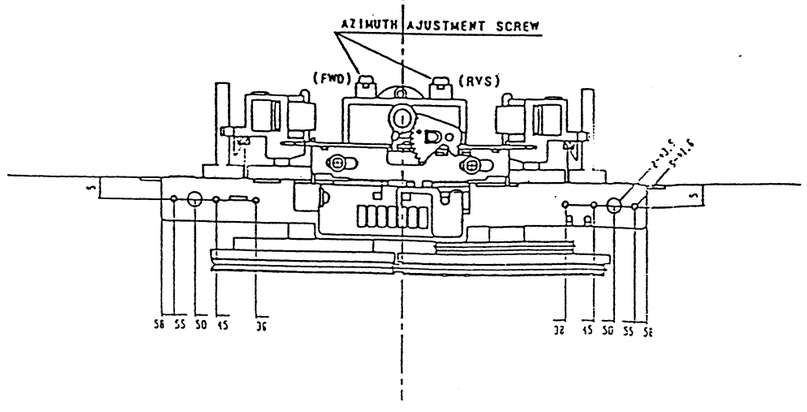


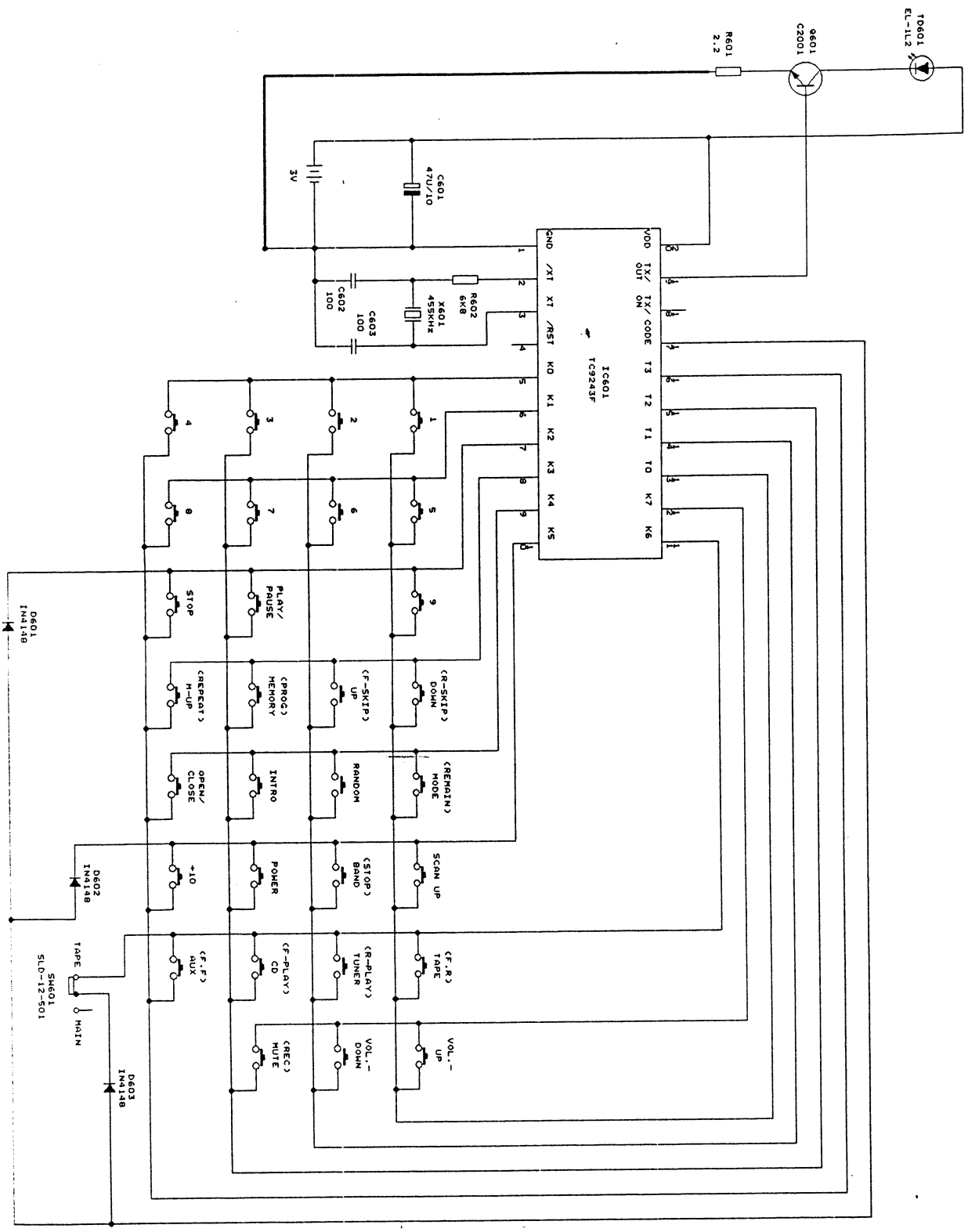






DETAIL OF RELAY BORD



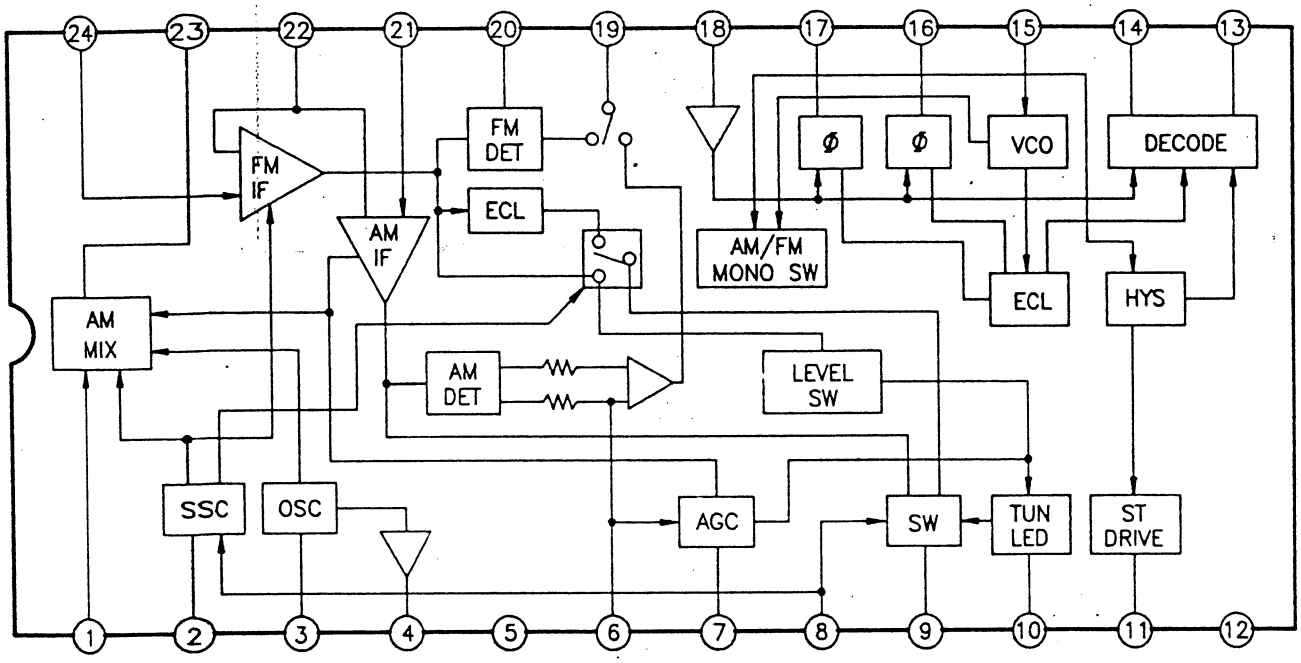


KOSONIC INDUSTRIES CO., LTD.

TITLE: SCHEMATIC DIAGRAM	
MODEL: CDK-339R/CDK-620R/CDK-420R	SHEET 1 OF 1
DESCRIPTION: REMOTE HANDSET PCB	REV: VER: 1
CODE FILE: 339-R	SIZE: C
DWN BY: LEUNG KIN WAI	DATE: 3-6-94

I.C. DIAGRAM AND DC VOLTAGES

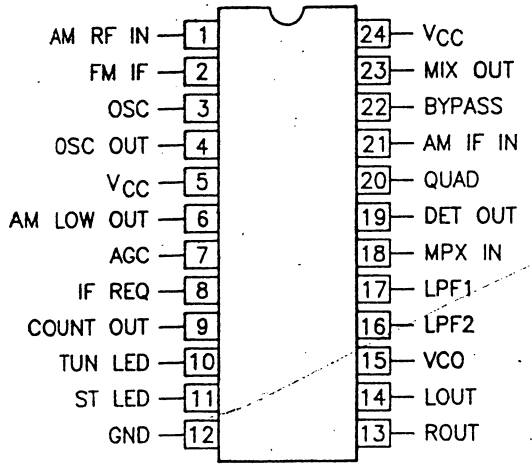
TA8132AN



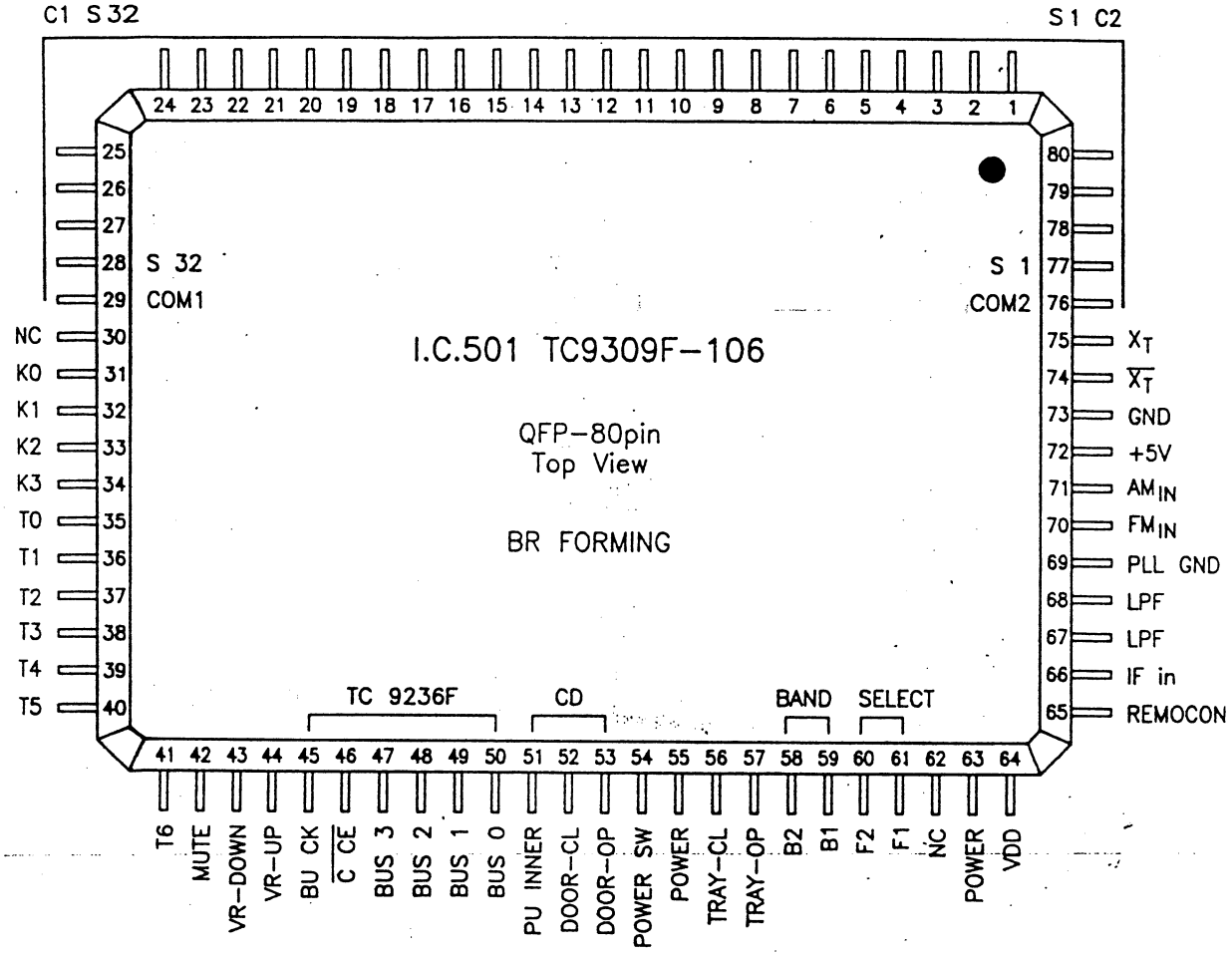
I.C.2 TA8132AN(FM)											
1	2	3	4	5	6	7	8	9	10	11	12
3.61	3.58	3.64	3.61	3.61	2.97	0.42	0.01	3.61	0.20	5.02	0
13	14	15	16	17	18	19	20	21	22	23	24
0.99	0.99	2.90	2.74	2.62	0.63	1.03	2.72	3.60	3.42	3.61	3.52

I.C.2 TA8132AN(AM)											
1	2	3	4	5	6	7	8	9	10	11	12
3.32	3.28	3.30	2.94	3.32	2.71	0.19	0.02	3.31	0.35	5.02	0
13	14	15	16	17	18	19	20	21	22	23	24
0.99	0.99	2.81	3.31	3.31	0.63	1.27	2.73	3.24	2.58	3.32	3.32

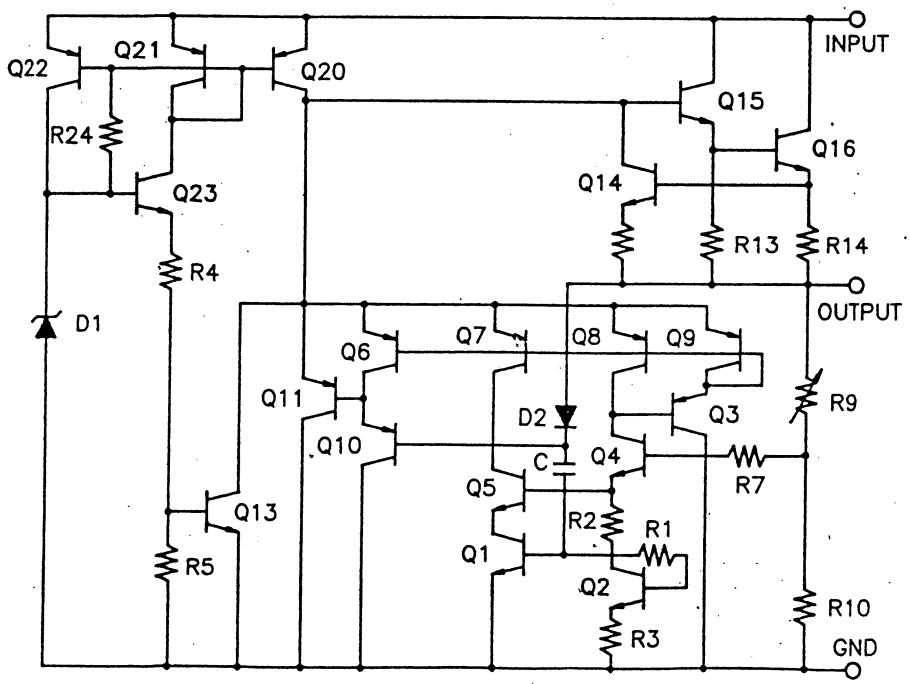
TA8132AN



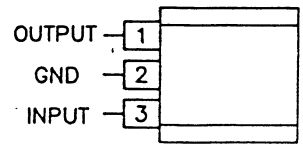
TC9309F



KA78L05AZ

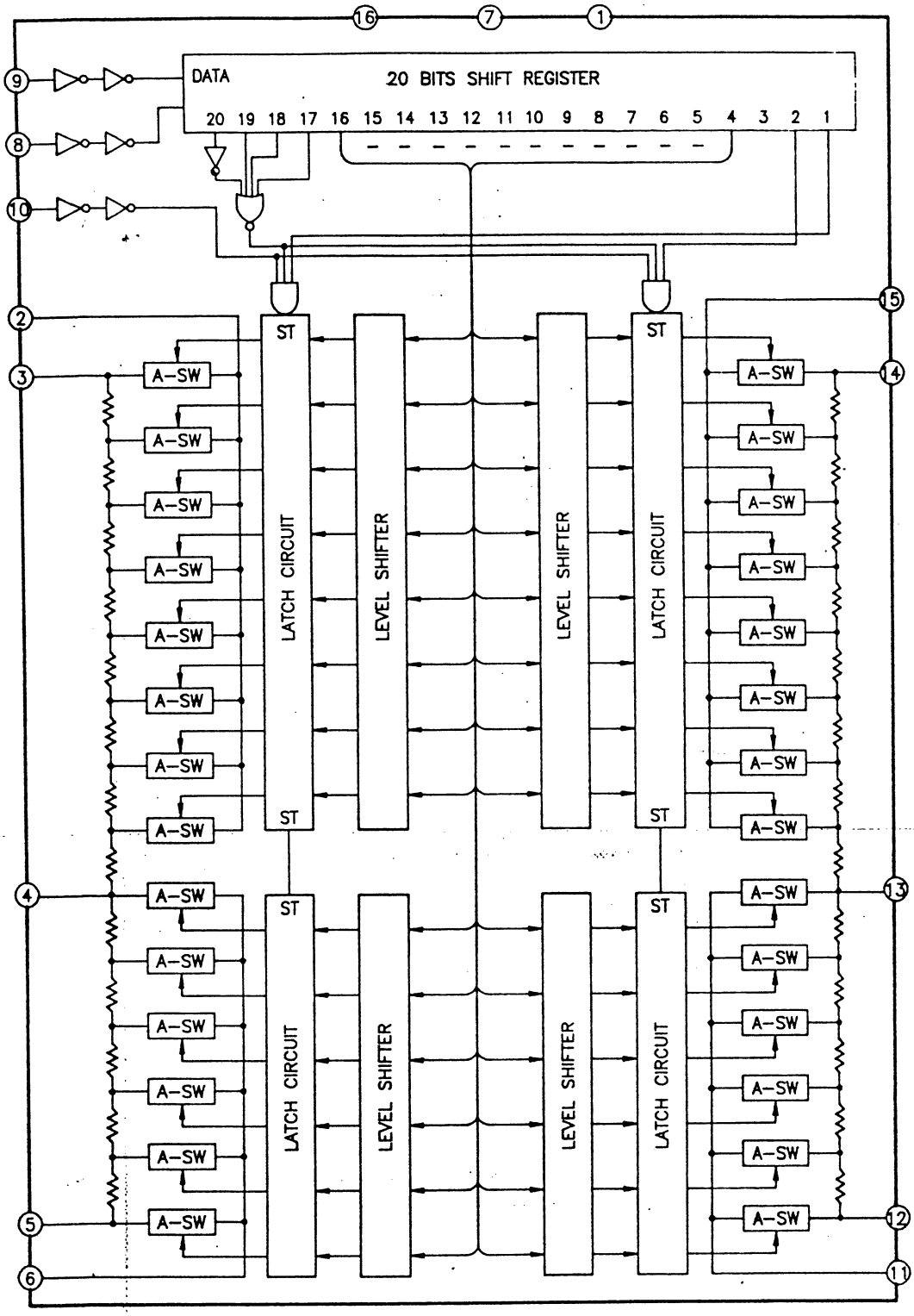


KA78L05AZ 5V 100mA

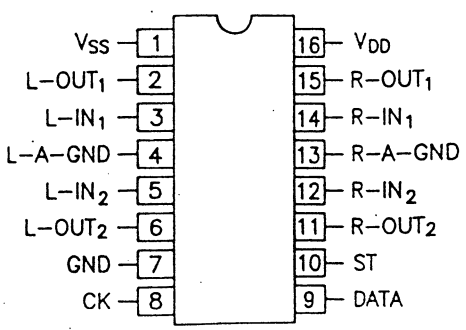


I.C.502 KA78L05A		
1	2	3
4.97	0	13

TC9176P

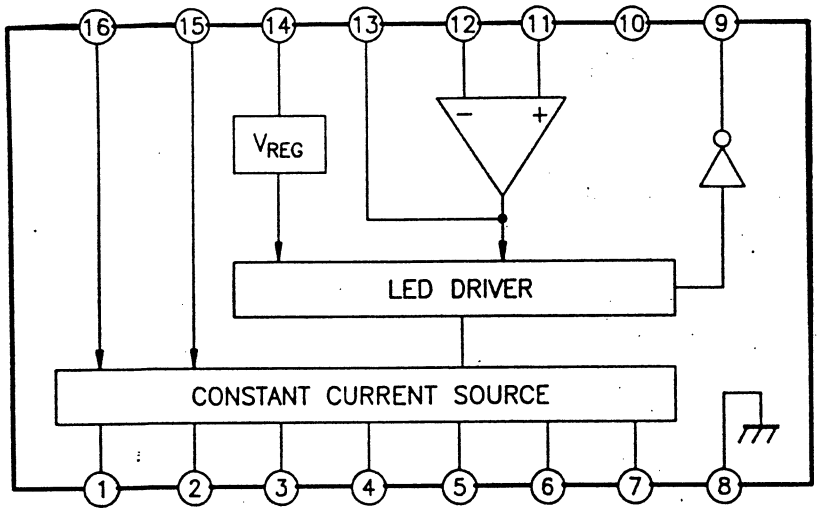


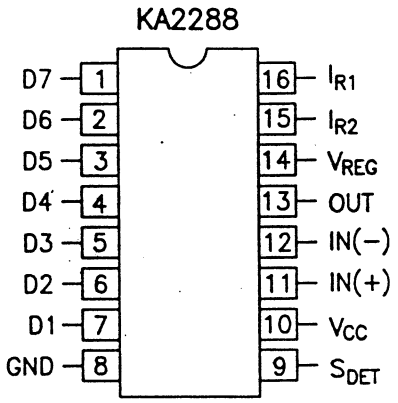
TC9176P



I.C.706 TC9176P							
1	2	3	4	5	6	7	8
-8.0	0	0	0	0	0	0	0
9	10	11	12	13	14	15	16
0	0	0	0	0	0	0	7.92

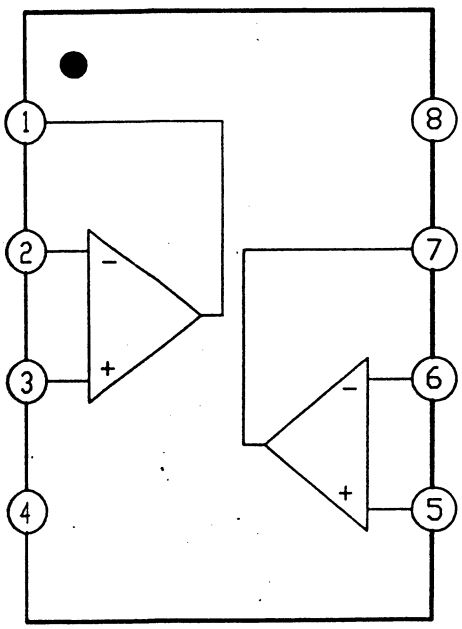
KA2288

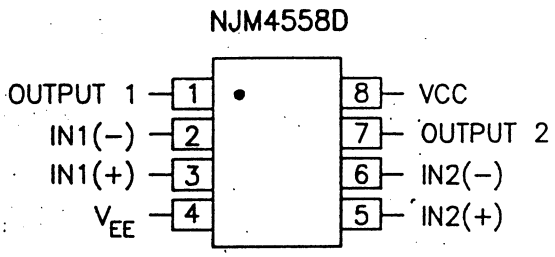




U601–605 KA2288															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3.50	4.61	6.05	4.74	6.08	4.75	6.10	0	0	7.55	0	0.01	0.16	2.76	0	0.77

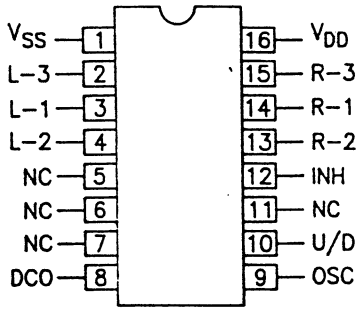
NJM4558D



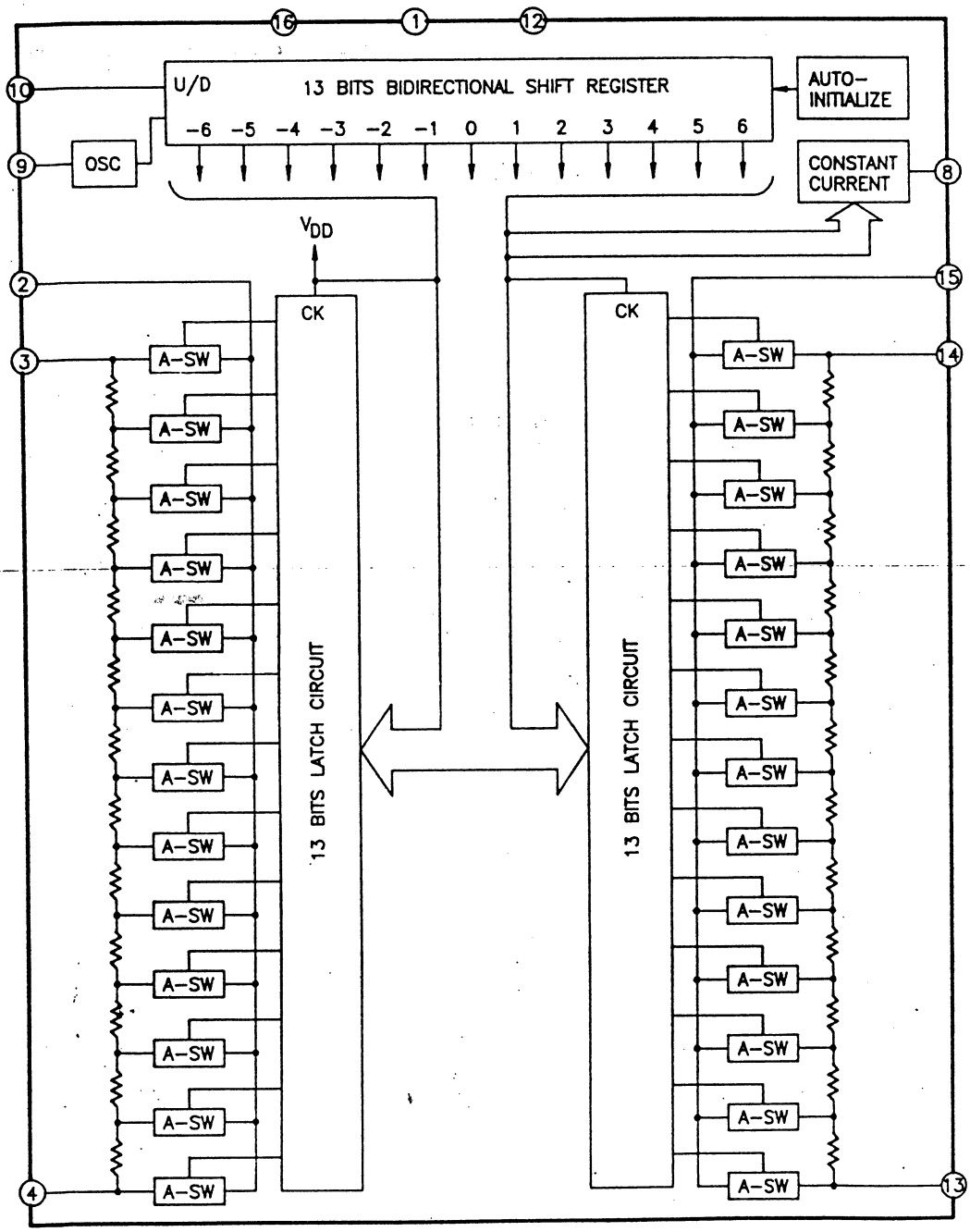


U606–608 NJM4558D							
1	2	3	4	5	6	7	8
3.30	3.20	3.20	0	3.10	3.30	3.20	6.40

TC9169AP

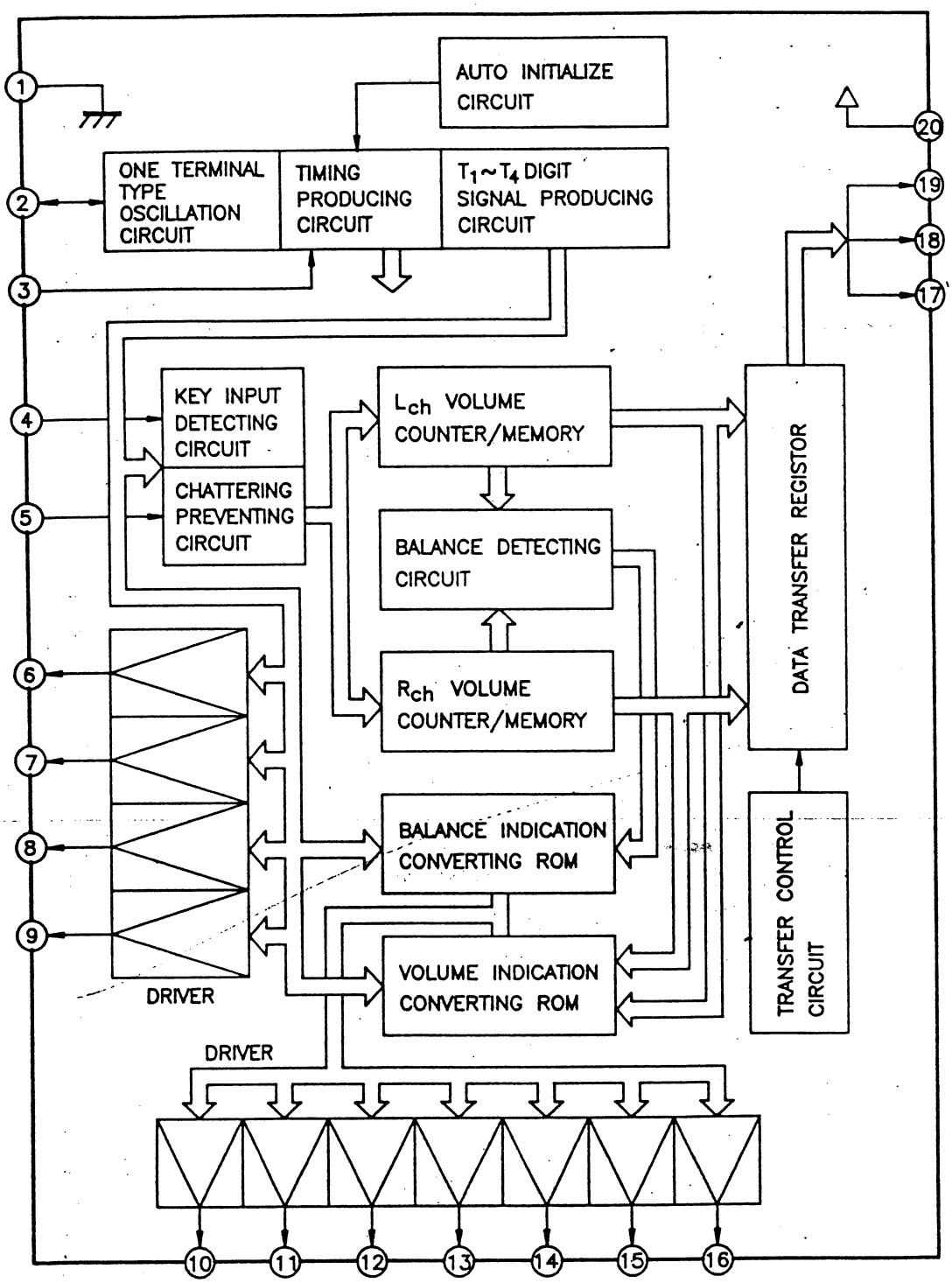


TC9169AP

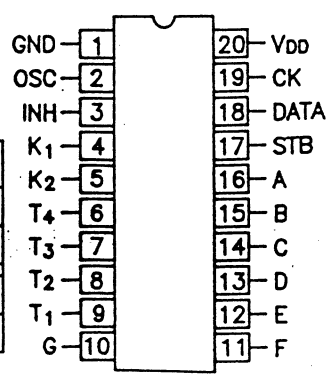


I.C.703,704 TC9169AP															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-7.28	0	0	0	0	0	0	7.35	7.28	7.34	0	7.35	0	0	0	7.35

TC9185P

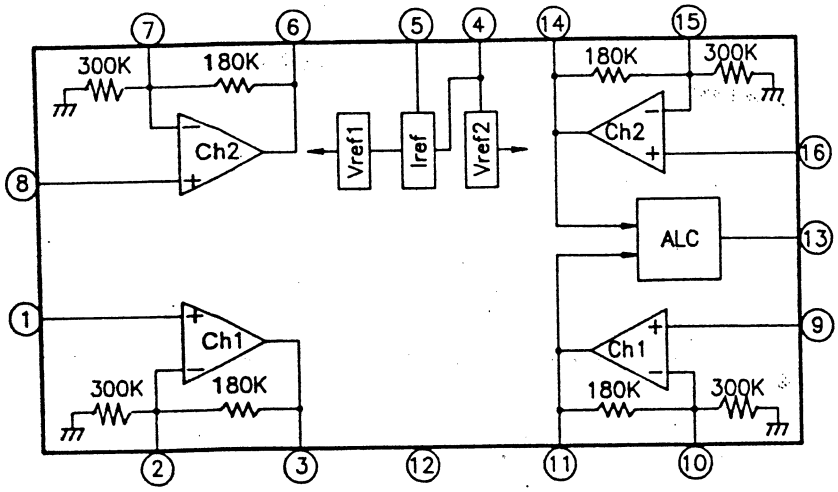


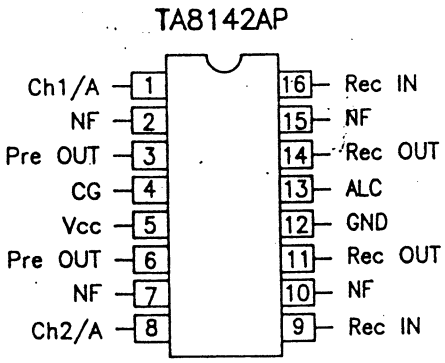
TC9185P



I.C.707 TC9185P									
1	2	3	4	5	6	7	8	9	10
0	2.76	3.96	0	0	1.16	1.11	1.16	1.16	2.01
11	12	13	14	15	16	17	18	19	20
0	0	0	1.02	1.02	1.02	0	0	0	5

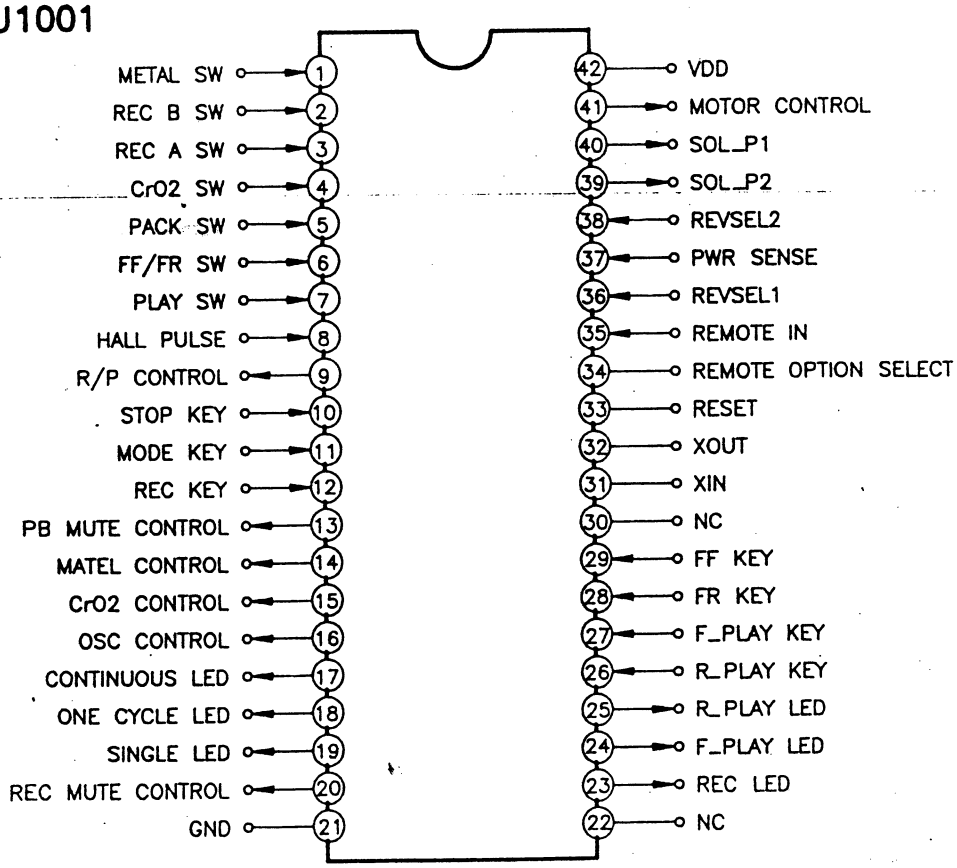
TA8142AP





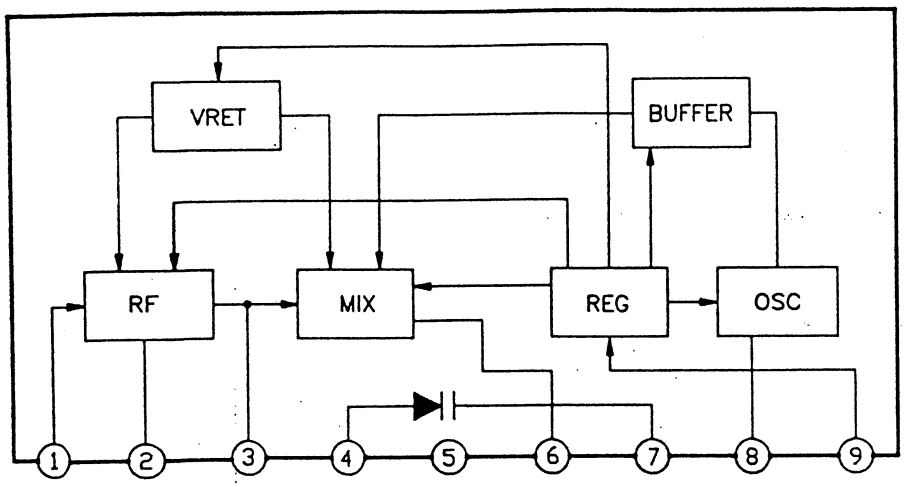
I.C.301 TA8142AP															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.08	1.37	2.24	1.45	6.00	2.24	1.37	0.08	0.03	1.30	2.33	0	0.79	2.33	1.30	0.03

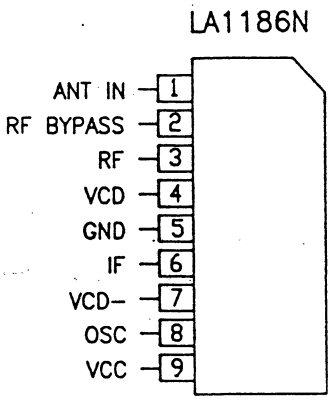
KPU1001



I.C.302 KPU1001													
1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	4.95	4.95	0	0	4.95	0.01	4.82	0.69	4.95	4.95	4.95	0.11	0.01
15	16	17	18	19	20	21	22	23	24	25	26	27	28
0.01	0.03	3.41	0.11	3.43	1.49	0	0.25	3.53	3.53	0.11	4.94	4.94	4.94
29	30	31	32	33	34	35	36	37	38	39	40	41	42
4.94	0.01	2.04	2.23	4.97	0	4.85	0	4.97	0	9.89	9.89	0.75	4.97

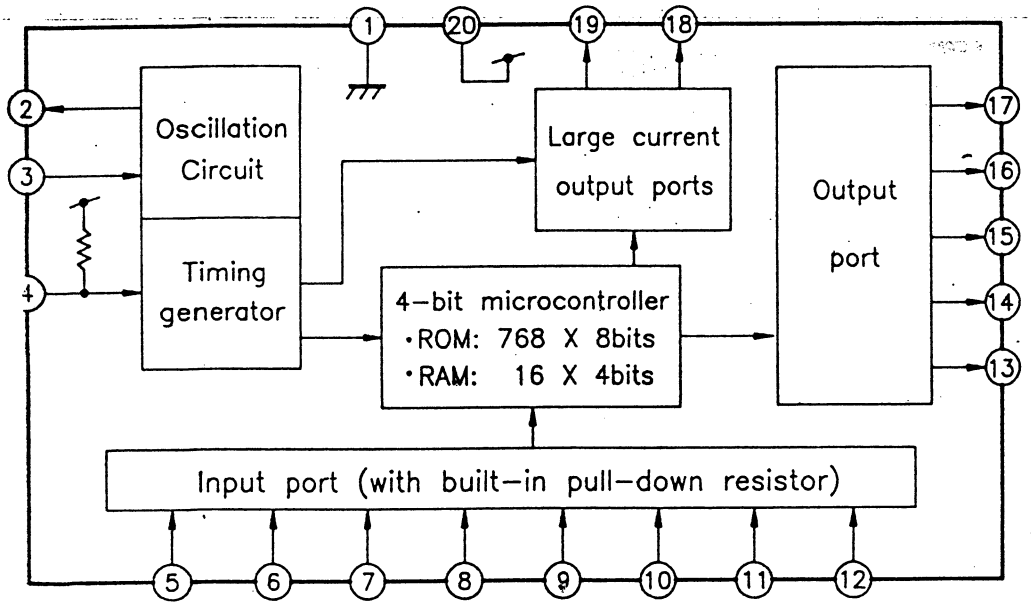
LA1186N

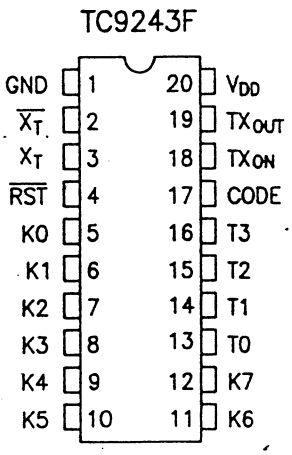




I.C.1 LA1186N								
1	2	3	4	5	6	7	8	9
0.96	1.67	4.29	0	0	4.81	0	4.08	4.81

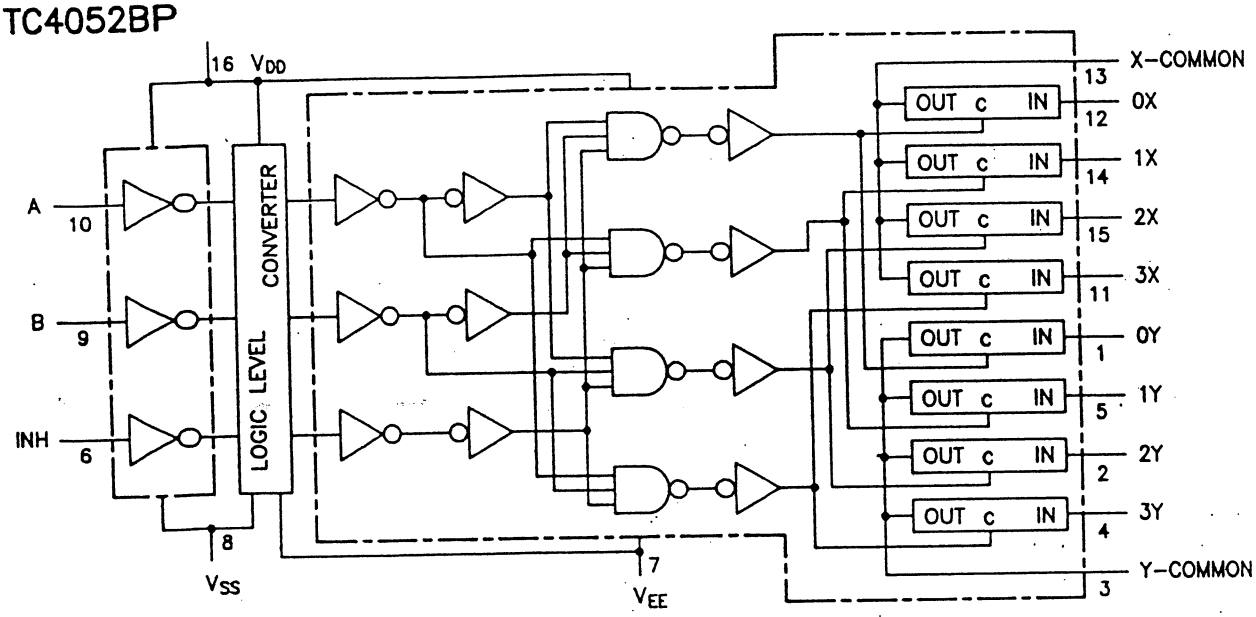
TC9243F





I.C.601 TC9243F									
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0
11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	0	0	0	0	3.20

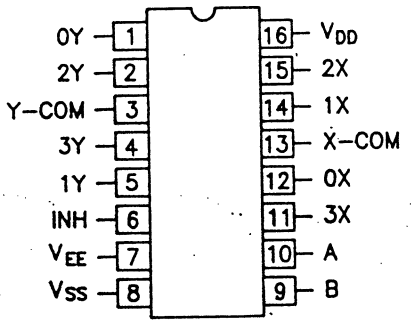
TC4052BP



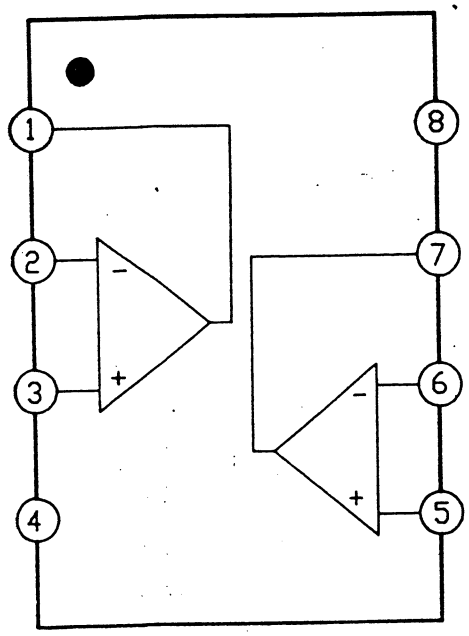
I.C.701 TC4052BP															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	0	0	0	0	0	−8.0	0	H:8.0 L:0	H:8.0 L:0	0	0	0	0	0	8.0

I.C.702 TC4052BP															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
H:8.0 L:0.2	H:8.0 L:0.2	0	H:8.0 L:0.2	H:8.0 L:0.2	0	0	0	H:8.0 L:0	H:8.0 L:0	H:8.0 L:0	H:8.0 L:0	8.0	H:8.0 L:0	H:8.0 L:0	8.0

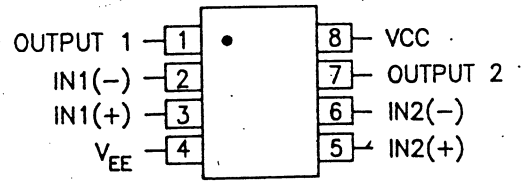
TC4052BP



NJM4558D

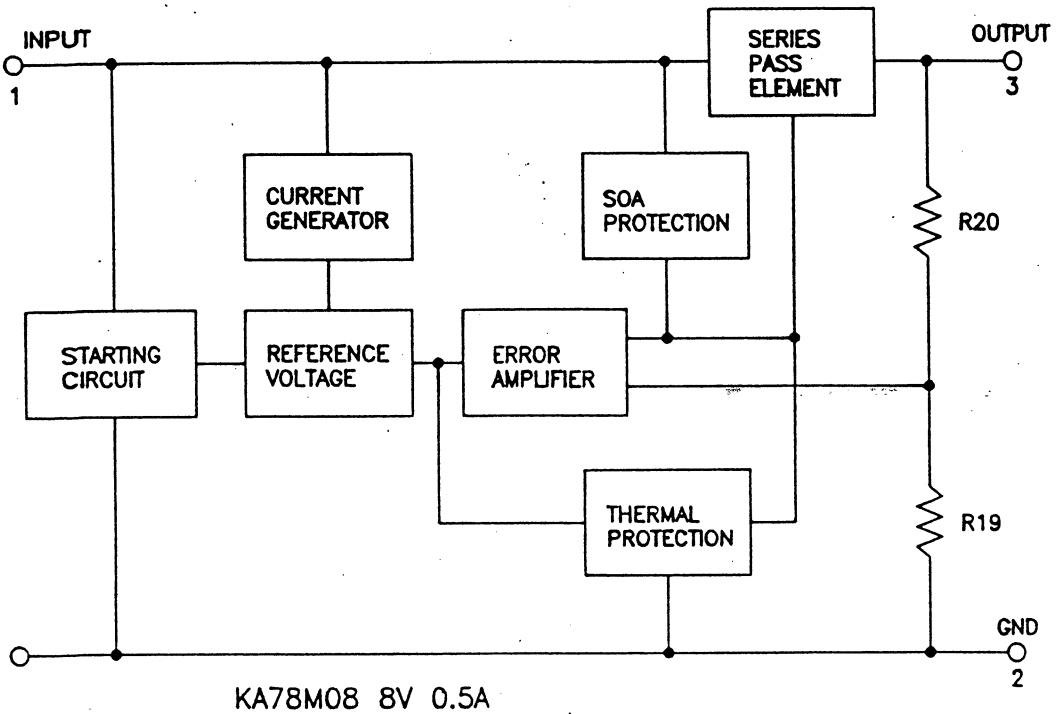


NJM4558D

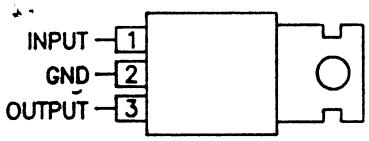


I.C.705,708 NJM4558D							
1	2	3	4	5	6	7	8
0	0	0	−8.0	0	0	0	8.0

KA78M08

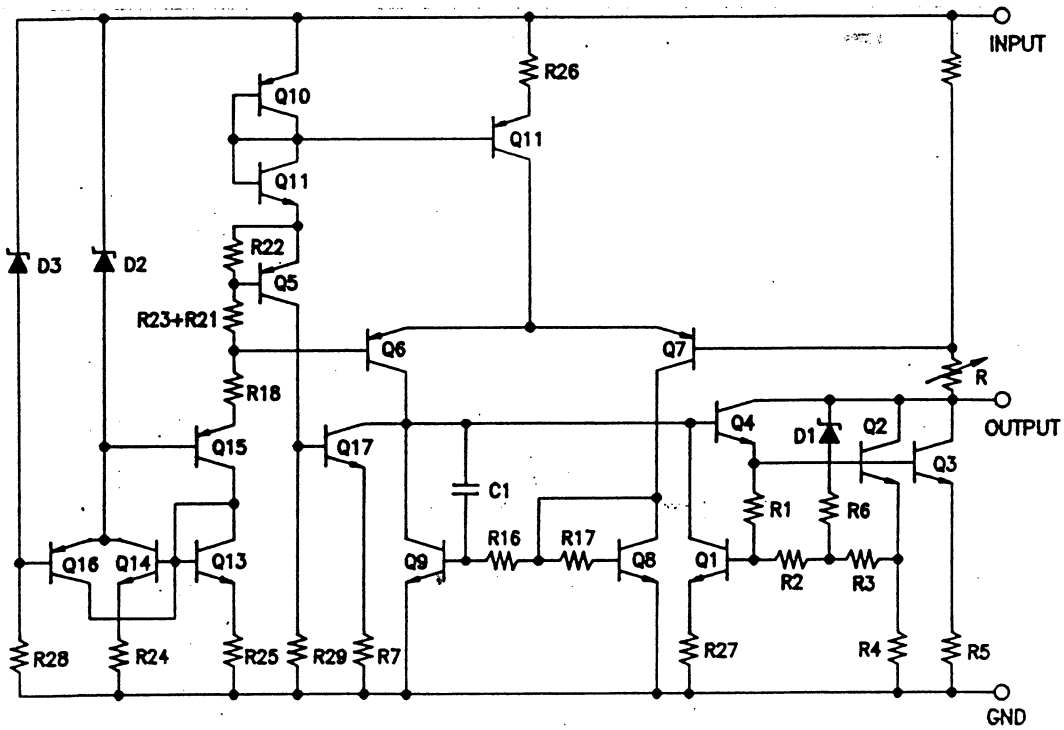


KA78M08 8V 0.5A

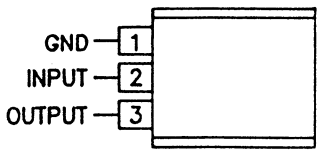


I.C.901 KA78M08		
1	2	3
19.22	0	8.0

KA79L08

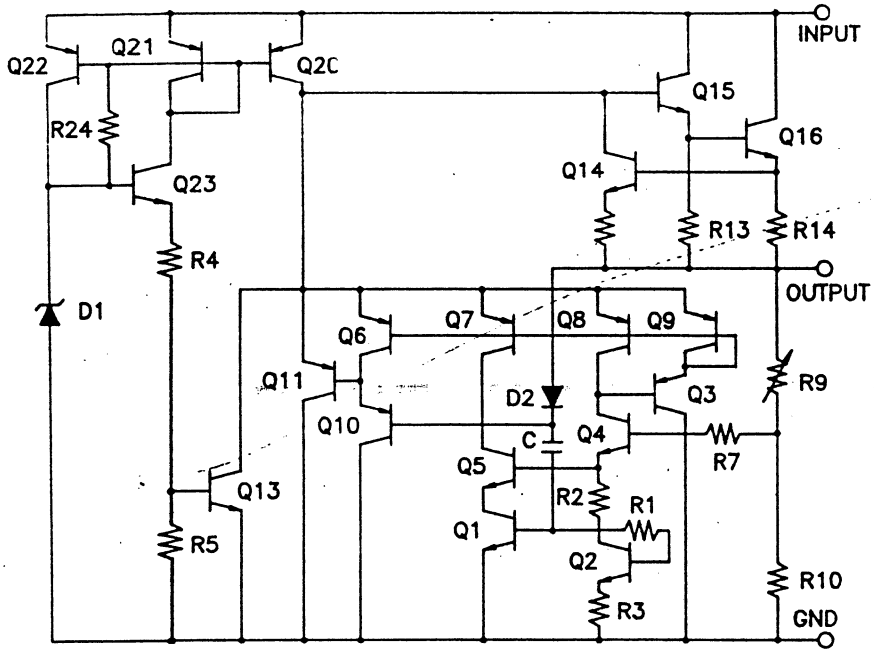


KA79L08 −8V 100mA

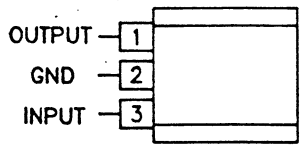


I.C.902 KA79L08		
1	2	3
0	−14.81	−7.92

KA78L05AZ

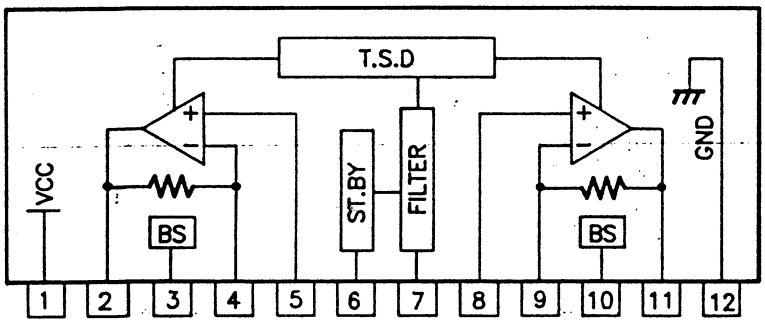


KA78L05AZ 5V 100mA



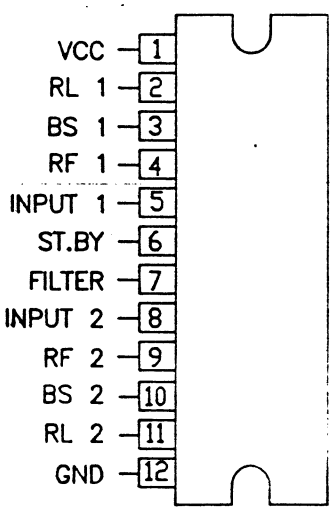
I.C.303 KA78L05A		
1	2	3
4.97	0	7.42

BA5412

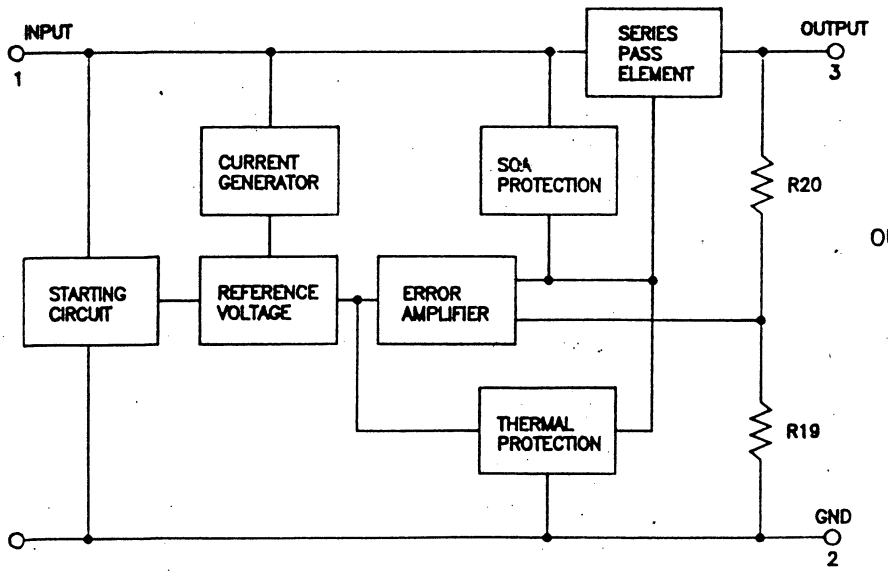


I.C.801 BA5412											
1	2	3	4	5	6	7	8	9	10	11	12
19.00	9.69	16.23	0.59	0	3.66	17.13	0	0.59	16.20	9.53	0

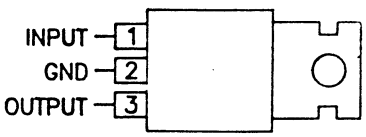
BA5412



KA7810



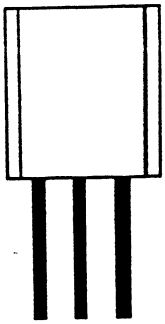
KA7810 10V 1A



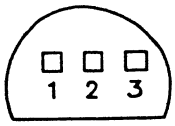
I.C.903 KA7810		
1	2	3
17.87	0	9.92

TRANSISTOR DIAGRAM AND DC VOLTAGES

2SC 945



E C B



1 EMITTER
2 COLLECTOR
3 BASE

Q4 C945		
B	C	E
0.65	0	0

	Q7 C945		
	B	C	E
MW:	0.02	6.09	0
LW:	0.67	0.01	0

Q8 C945		
B	C	E
3.91	3.30	3.30
0.01	0	3.34

	Q9 C945		
	B	C	E
MW:	0.03	0	3.30
LW:	3.96	3.34	3.34

Q12 C945		
B	C	E
0.61	0	0
0	0.69	0

Q16 C945		
B	C	E
0.64	0.03	0
0.01	7.01	0

Q301 C945		
B	C	E
0.02	0	0

Q302 C945		
B	C	E
0.02	0	0

Q303 C945		
B	C	E
0.71	0.01	0

Q304 C945		
B	C	E
0.71	0.01	0

Q305 C945		
B	C	E
0.71	0	0

Q306 C945		
B	C	E
0.71	0	0

Q308 C945		
B	C	E
0.69	0.02	0

Q310 C945		
B	C	E
0.03	9.62	0

Q311 C945		
B	C	E
0.11	0	0

Q312 C945		
B	C	E
0.11	0	0

Q316 C945		
B	C	E
0.69	0	0

Q317 C945		
B	C	E
0.69	0	0

Q502 C945		
B	C	E
1.06	4.41	0.60

Q503 C945		
B	C	E
0.60	4.41	0

Q701 C945		
B	C	E
1.49	3.98	0.90

Q702 C945		
B	C	E
1.49	3.98	0.90

Q703 C945		
B	C	E
0.01	3.02	0

Q704 C945		
B	C	E
0.01	3.01	0

Q705 C945		
B	C	E
1.52	2.52	0.91

Q706 C945		
B	C	E
0.01	0	0

Q707 C945		
B	C	E
0.01	0.02	0

Q708 C945		
B	C	E
0.03	0.02	0

Q709 C945		
B	C	E
0.02	7.93	0

Q711 C945		
B	C	E
0.65	0.03	0

Q712 C945		
B	C	E
0.17	0.94	0

Q801 C945		
B	C	E
0.01	0	0

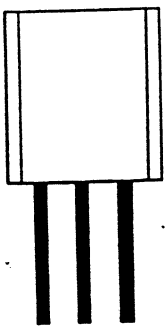
Q802 C945		
B	C	E
0.01	0	0

Q904 C945		
B	C	E
0.69	0.08	0

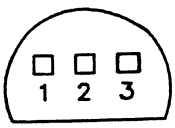
Q906 C945		
B	C	E
0.72	0.15	0

Q908 C945		
B	C	E
0.73	0.10	0

2SA 733



E C B



1 EMITTER
2 COLLECTOR
3 BASE

	Q5 A733		
	B	C	E
FM:	4.19	2.62	3.61
AM:	2.61	3.31	3.31

Q6 A733		
B	C	E
4.19	2.62	3.61
2.61	3.31	3.31

Q10 A733		
B	C	E
2.75	3.30	3.31
6.94	0	3.33

	Q11 A733		
	B	C	E
FM:	6.06	0	3.31
AM:	2.77	3.34	3.33

Q15 A733		
B	C	E
4.73	5.39	5.45

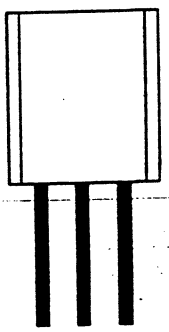
Q307 A733		
B	C	E
7.26	7.82	7.94

Q501 A733		
B	C	E
0.21	0.20	0.26

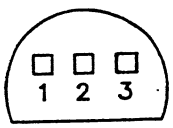
Q710 A733		
B	C	E
7.17	7.83	7.92

Q902 A733		
B	C	E
12.42	13.07	13.11

2SC 2001



E C B



1 EMITTER
2 COLLECTOR
3 BASE

Q309 C2001		
B	C	E
9.90	9.93	9.62

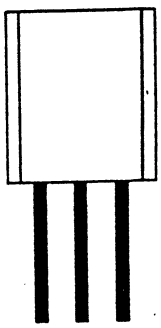
Q315 C2001		
B	C	E
0.75	0.06	0

Q504 C2001		
B	C	E
0.73	0.31	0

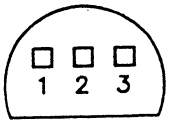
Q601 C2001		
B	C	E
0	2.80	0

Q901 C2001		
B	C	E
-13.7	-14.3	-14.3

2SA 952



E C B

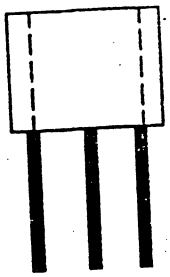


1 EMITTER
2 COLLECTOR
3 BASE

Q313 A952		
B	C	E
9.94	0	9.94

Q314 A952		
B	C	E
9.89	0	9.94

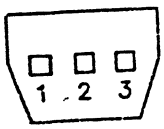
2SK 192A



Q1 K192A		
D	S	G
1.93	0	0

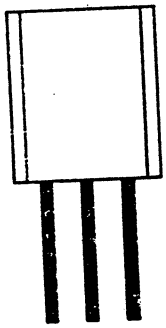
Q17 K192A		
D	S	G
0	1.34	0

D S G



1 DRAIN
2 SOURCE
3 GATE

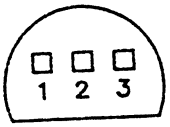
2SC 2878



Q13 C2878		
B	C	E
MW: 0.65	0	0
LW: 0	0	0

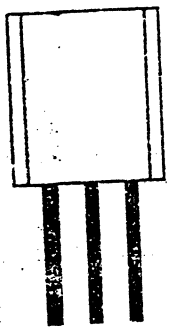
Q14 C2878		
B	C	E
0	0	0
0.69	0	0

E C B



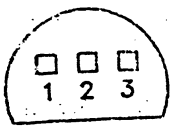
1 EMITTER
2 COLLECTOR
3 BASE

2SC 1674L



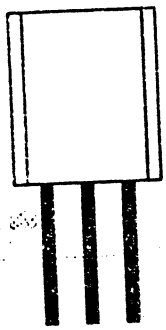
Q2 C1674L		
B	C	E
0.75	3.32	0

E C B



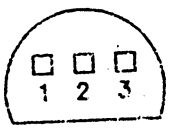
1 EMITTER
2 COLLECTOR
3 BASE

2SC 1675L



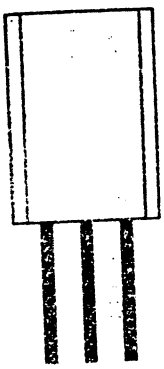
Q3 C1675L		
B	C	E
1.15	4.42	0.45

E C B



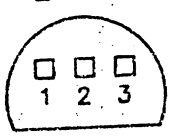
1 EMITTER
2 COLLECTOR
3 BASE

2SC 2060



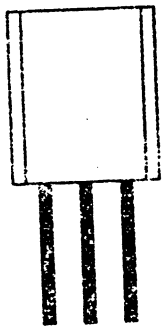
Q505 C2060		
B	C	E
10.36	13	9.71

E C B



1 EMITTER
2 COLLECTOR
3 BASE

2SA 1020

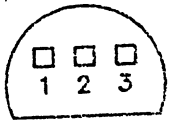


Q903 A1020		
B	C	E
12.37	13.10	13.12

Q905 A1020		
B	C	E
18.06	18.80	18.81

Q907 A1020		
B	C	E
9.09	9.82	9.85

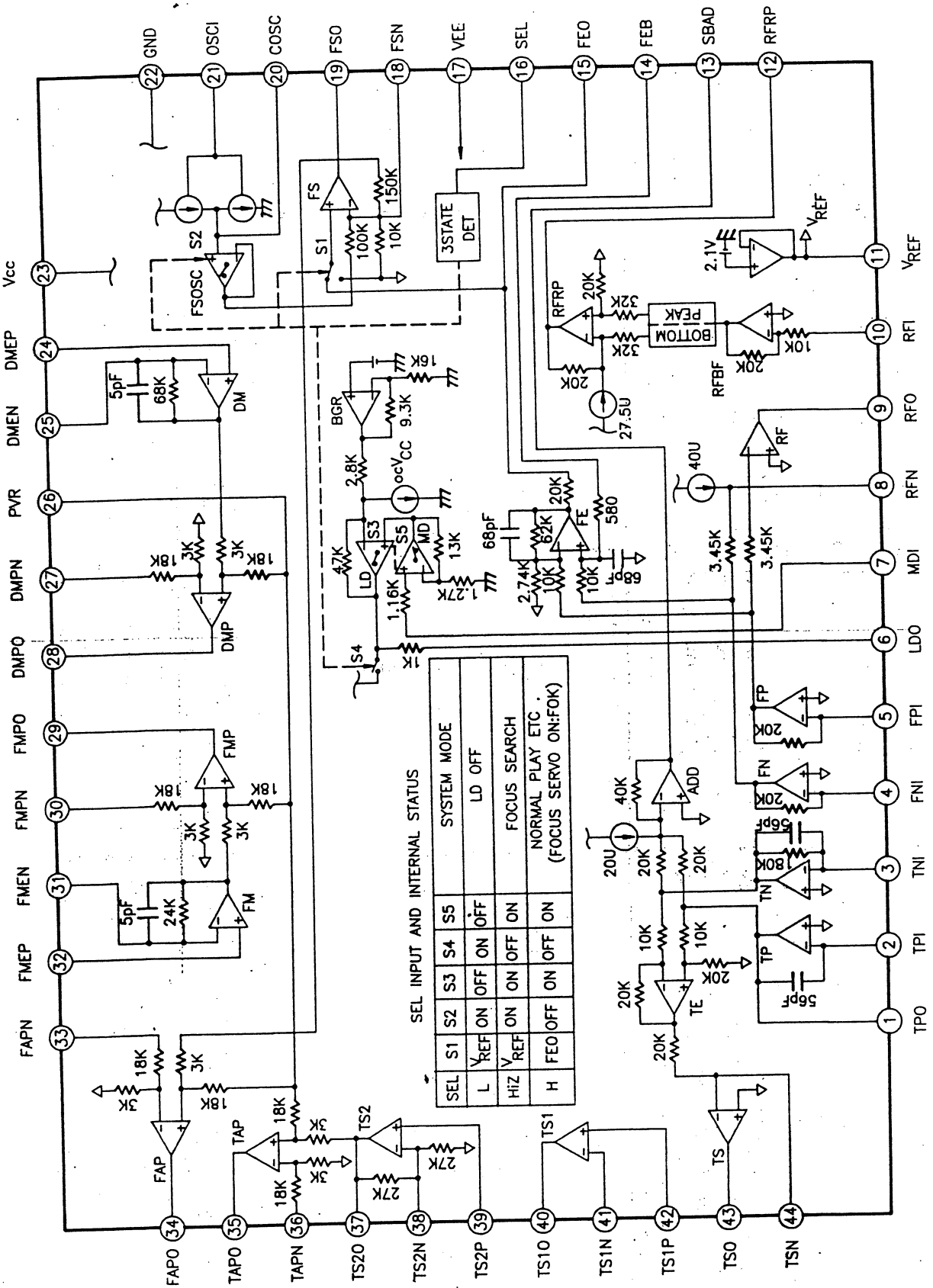
E C B

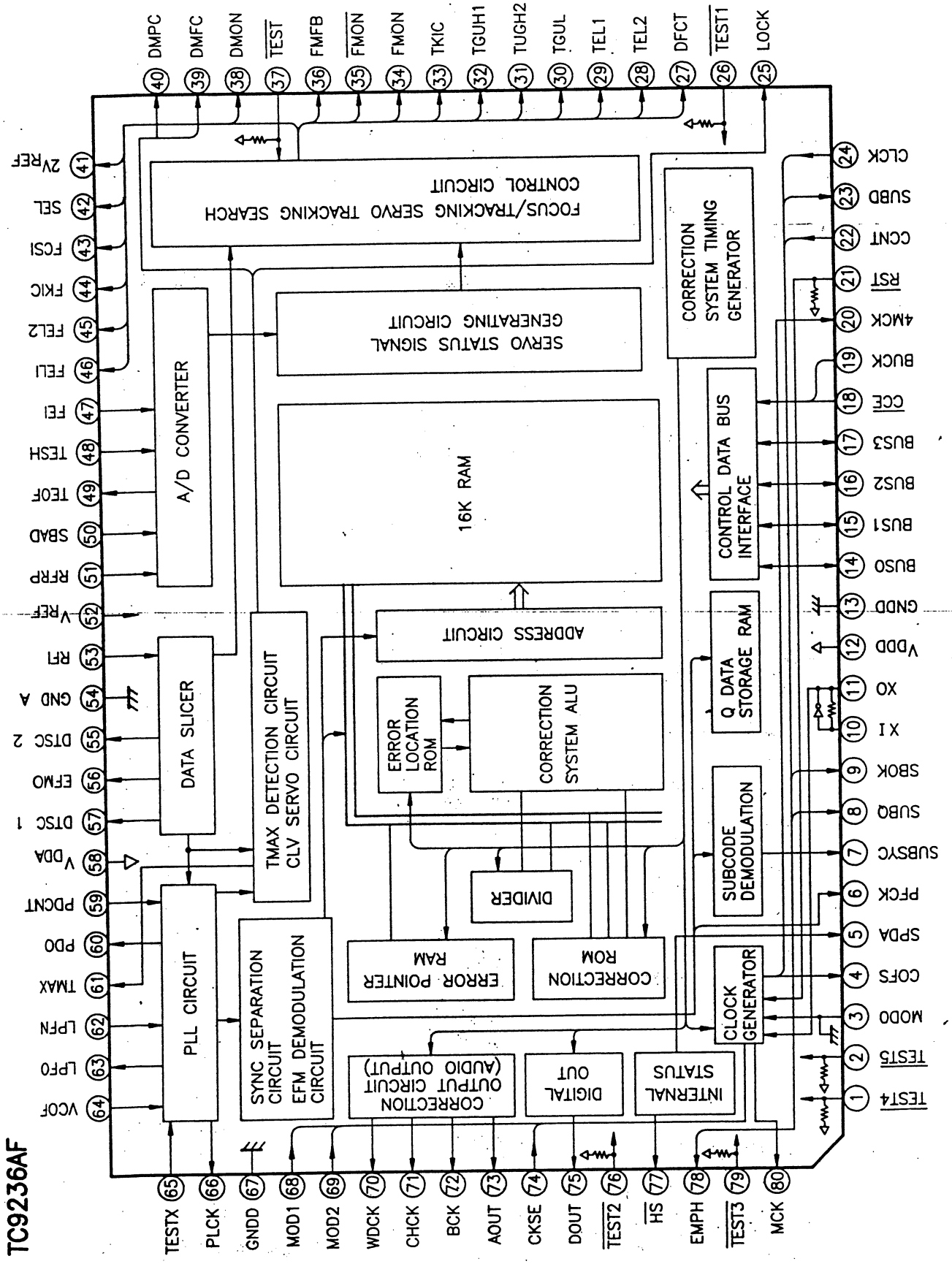


1 EMITTER
2 COLLECTOR
3 BASE

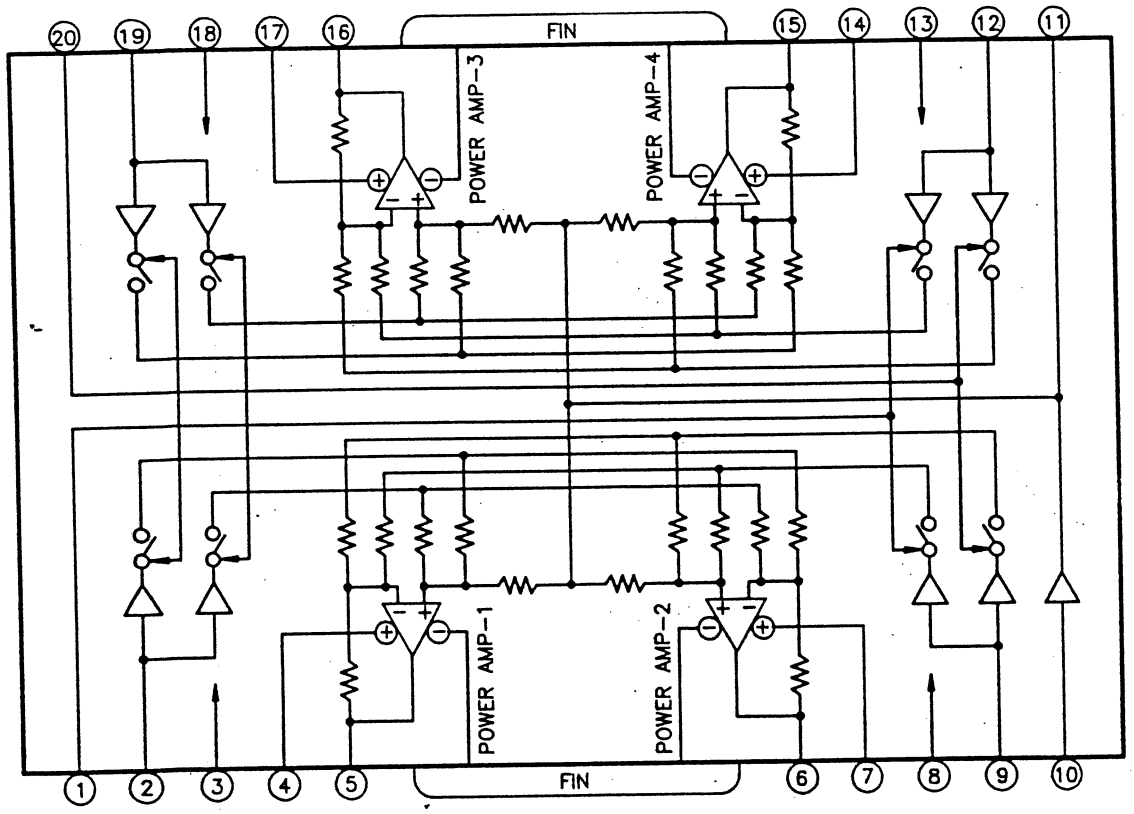
I.C. DIAGRAM(CD)

TA8191F

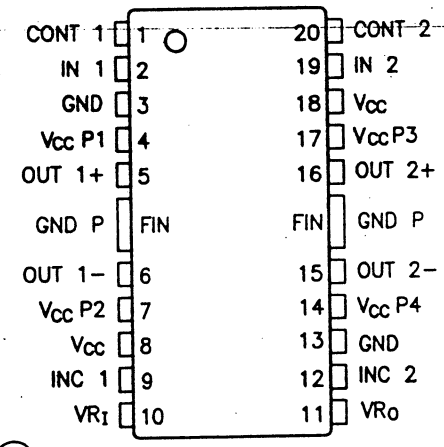



TC9236AF
DMPC
DMFC
DMON
TEST
FMFB
FMON
FMON
TKIC
TGUH1
TUGH2
TGUL
TEL1
TEL2
DFCT
TEST1
LOCK
2VREF
SEL
FCSI
FKIC
FEL2
FELI
FEI
TESH
TEOF
SBAD
RFRP
VREF
RFI
GND A
DTSC 2
EFMO
DTSC 1
VDDA
PDCNT
PDO
TMAX
LPFN
LPFO
VCOF
CLCK
SUBD
CCNT
RST
4MCK
BUCK
CCE
BUS3
BUS2
BUS1
BUS0
GNDD
VDDD
XO
XI
SBOK
SUBQ
SUBSYC
PFCK
SPDA
COFS
MODO
TEST5
TEST4
FOCUS/TRACKING SERVO TRACKING SEARCH CONTROL CIRCUIT
SERVO STATUS SIGNAL GENERATING CIRCUIT
CORRECTION SYSTEM TIMING GENERATOR
A/D CONVERTER
16K RAM
CONTROL DATA BUS INTERFACE
ADDRESS CIRCUIT
Q DATA STORAGE RAM
DATA SLICER
TMAX DETECTION CIRCUIT CLV SERVO CIRCUIT
ERROR LOCATION ROM
CORRECTION SYSTEM ALU
SUBCODE DEMODULATION
DIVIDER
PLL CIRCUIT
SYNC SEPARATION CIRCUIT EFM DEMODULATION CIRCUIT
ERROR POINTER RAM
CORRECTION ROM
CLOCK GENERATOR
CORRECTION OUTPUT CIRCUIT (AUDIO OUTPUT)
DIGITAL OUT
INTERNAL STATUS
TESTX
PLCK
GNDD
MOD1
MOD2
WDCK
CHCK
BCK
AOUT
CKSE
DOUT
TEST2
HS
EMPH
TEST3
MCK

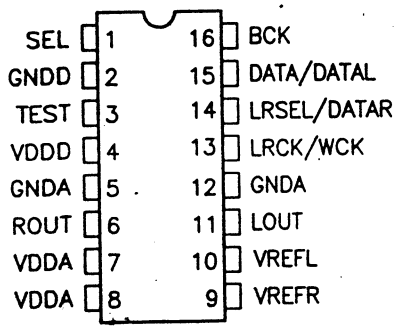
TA8192F



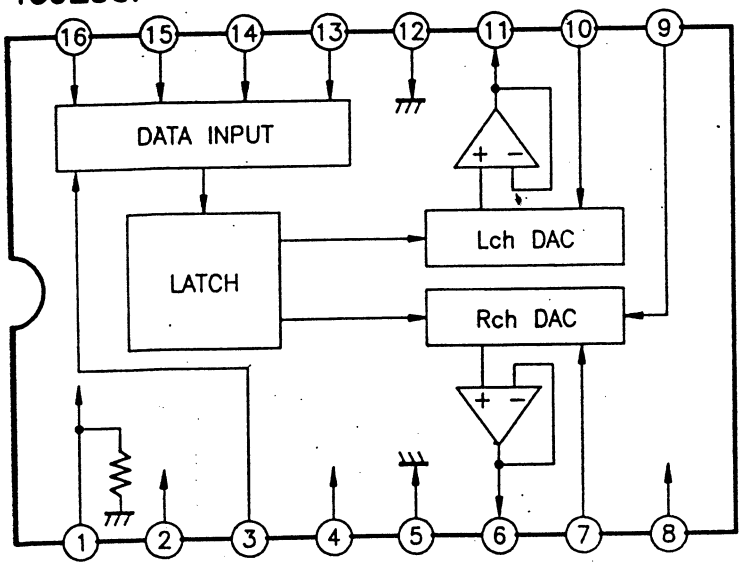
TA8192F



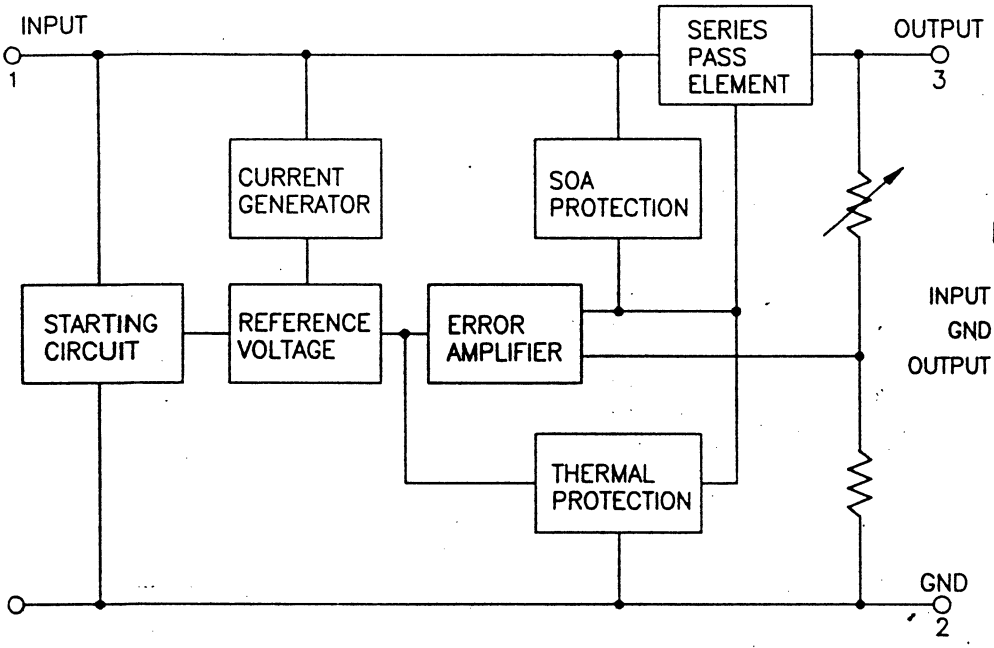
TC9250F



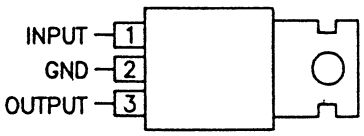
TC9250F



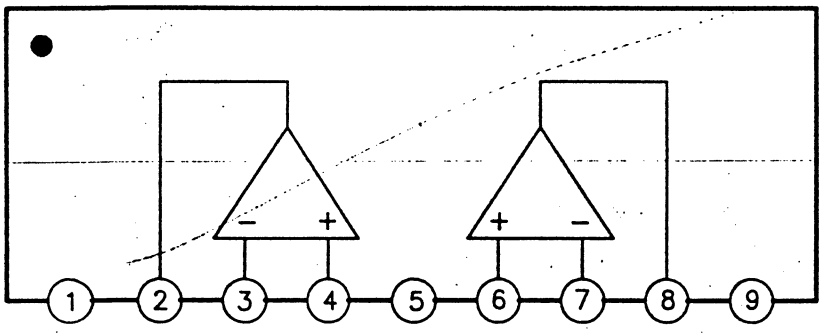
KA7805



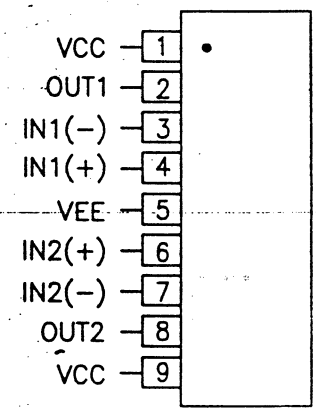
KA7805 5V 1A



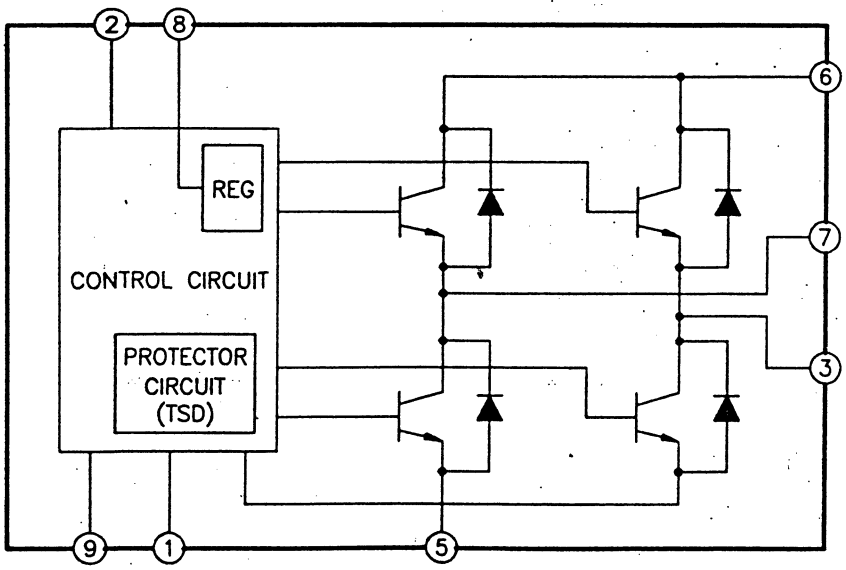
MC4558CS



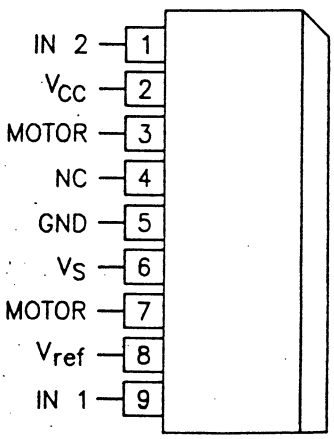
MC4558CS



TA7291S



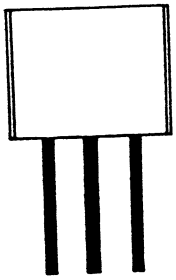
TA7291S



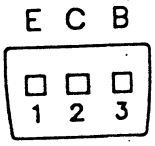
* 4 PIN : NC

TRANSISTOR DIAGRAM AND DC VOLTAGES(CD)

2SA1048GR

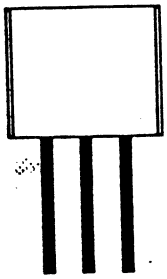


TR2 A1048		
B	C	E
4.99	4.26	4.39



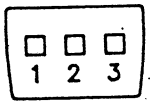
1 EMITTER
2 COLLECTOR
3 BASE

RN1210



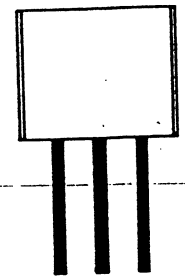
TR3 RN1210		
B	C	E
0	0.02	0

TR4 RN1210		
B	C	E
0	0.02	0

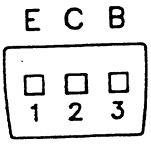


1 EMITTER
2 COLLECTOR
3 BASE

2SC2458GR

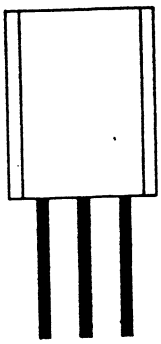


TR7 C2458		
B	C	E
2.12	2.12	2.14

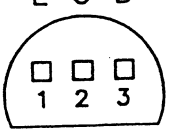


1 EMITTER
2 COLLECTOR
3 BASE

KSA1015GR



TR8 A1015		
B	C	E
4.55	2.11	3.82



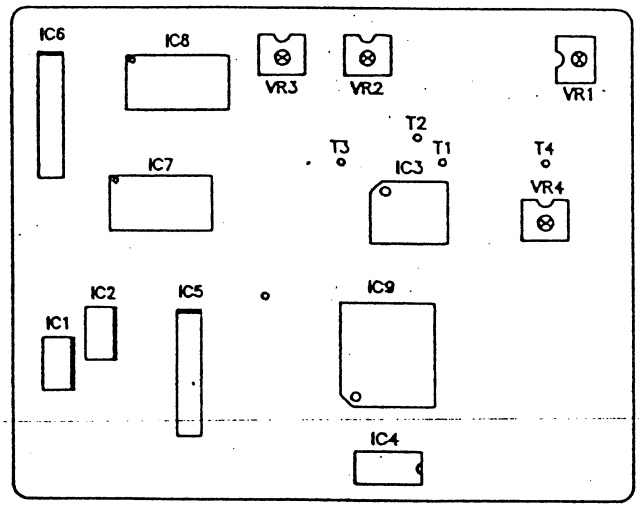
1 EMITTER
2 COLLECTOR
3 BASE

ALIGNMENT INSTRUCTIONS

* EGUIPMENT REGUIRED

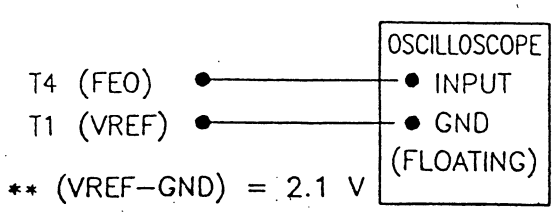
1. FREQUENCY COUNTER
2. OSCILLOSCOPE (>40MHZ)
3. VOLTAGE METER (VTVM)
4. REFERENCE DISC FOR ADJUSTMENTS:SONY YEDS-18 (TYPE 4)

* ADJUSTMENT LOCATION : PCB608



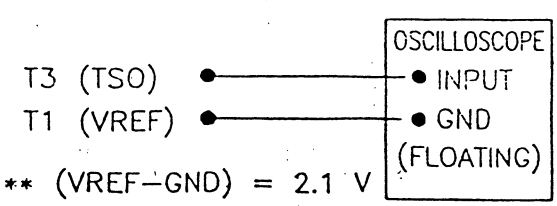
1. FOCUS OFFSET (FOF)

1.1 CD IN STOP MODE.
1.2 SCOPE : VOLT/DIV=2mV,TIME/DIV=0.2 mS
1.3 SET SCOPE TO GND POSITION AND ADJUST TRACE POSITION = 0 V
1.4 SET SCOPE TO DE POSITION.
1.5 ADJUST VR1(100K) TO SET FOCUS OFF SET = 0 +- 10 mV



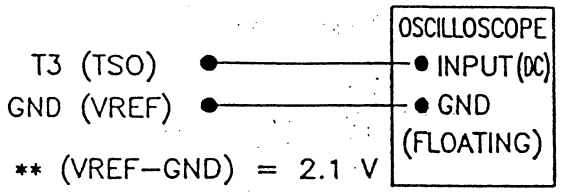
2. TRACKING OFFSET (TOF)

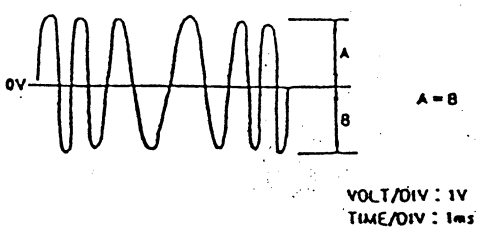
2.1 CD IN STOP MODE.
2.2 SCOPE : VOLT/DIV = 2mV, TIME/DIV = 0.2mS
2.3 SET SCOPE TO GND POSITION AND ADJUST TRACE POSITION = 0 V
2.4 SET SCOPE TO DE POSITION.
2.5 ADJUST VR3(100K) TO SET FOCUS OFF SET = 0 +- 10mV



3. TRACKING BALANCE TEB

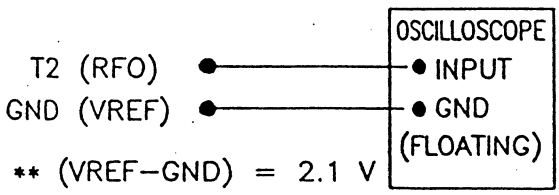
3.1 PLAY YEDS-18 (TYPE 4)
3.2 SCOPE : VOLT/DIV = 20 mV,TIME/DIV = 1 mS
3.3 SET SCOPE TO GND POSITION AND ADJUST TRACE POSITION = 0 V
3.4 SET SCOPE TO DC POSITION.
3.5 PRESS FF OR SEARCH
3.6 WHILE FF OR SEARCH IS DEPRESSED.
ADJUST VR2(100K) TO MAKE A = B AS ILLUSTRATED
(THE WAVEFORM IS TO BECOME SYMMETRICAL WITH RESPECT TO 0 POINT)

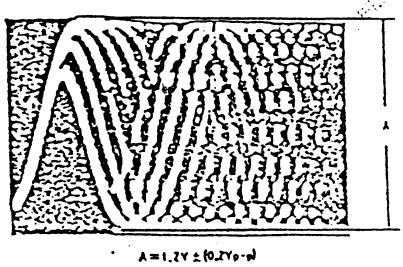




4. FOCUS BALANCE (FEB).....EYE PATTERN(RF LEVEL ADJUSTMENT)

4.1 PLAY YEDS-18 (TYPE 4)
4.2 SCOPE : VOLT/DIV = 20 mV,TIME/DIV = 0.5 uS
4.3 ADJUST VR4(10K) TO OBTAIN THAT THE 3T-LEVEL OF EYE-PATTERN IS MAXIMUM.





TEST AND MEASURING FOR AUDIO SPECIFICATIONS

a. GENERAL

THE TEST DISC MUST BE A SONY TYPE-4 (YEDS-18) OR A FULL EQUIVALENT TYPE.

THE SPECIFICATIONS OF LP-FILTER (LOW PASS FILTER) AND A-FILTER ARE AS FOLLOWS :

THE SPECIFICATIONS OF LP-FILTER ARE :
PASSBAND : 0 TO 30KHZ
STOPBAND : -60 DB/DECADE

A-FILTER IS THE WEIGHTING FILTER FOR NOISE EVALUATION WITCH IS STANDARD AT JIS OR IHF.

THE DISTORTION ANALYZER MUST BE A PANSONIC VP-7722A OR A EQUIVALENT TYPE IN DISTORTION MODE.

THE OUTPUT LEVEL METER MUST BE A PANSONIC VP-7722A OR A EQUIVALENT TYPE IN AC VOLTMETER MODE.

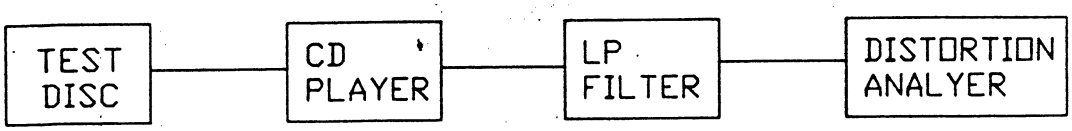
ALL MEASUREMENTS HAVE TO BE DONE FOR THE LEFT AND RIGHT CHANNEL.

NO PRE-EMPHASIS IS APPLIED.

THE PERFORMANCE PUBLISHED BY SONY IS THE REFERENCE FOR ANY MEASURING RESULT, WHEN LARGE DEVIATIONS OCCUR, THE PRODUCT UNDER TEST MIGHT BE DEFECTIVE OR THE MEASURING RESULTS MISLEADING. IN BOTH CASE, IT IS ADVISED TO CONSULT SONY.

b. HARMONIC DISTORTION + NOISE

BLOCK DIGRAM

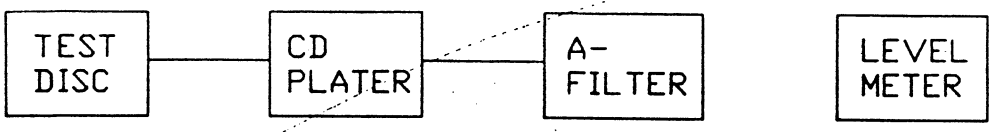


TEST FREQUENCY : - TRACK 2 FOR 1 KHz

MEASURING METHOD : - SWITCH THE LP FILTER CN
- MEASURE THE HARMONIC DISTORTION + NOISE

C. SIGNAL TO NOISE RATIO

BLOCK DIAGRAM



TEST FREQUENCY : - TRACK 2 FOR 1 KHz 0 DB
- TRACK 7 FOR SILENCE

MEASURING METHOD : - SWITCH THE A-FILTER ON
- SET AT TRACK 2 THE METER AT 0 DB
- MEASURE THE OUTPUT LEVEL AT TRACK 7

d. AMPLITUDE LINEARITY

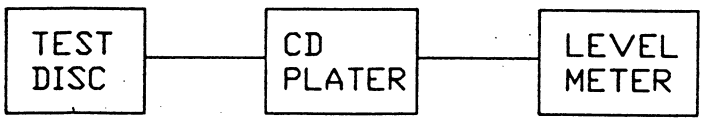
BLOCK DIAGRAM

TEST FREQUENCY : - TRACK 2 FOR 1 KHz

MEASURING METHOD : - SWITCH ALL FILTERS OFF
- MEASURE THE OUTPUT LEVEL

e. CHNNEL SEPARATION

BLOCK DIAGRAM



TEST FREQUENCY : - TRACK 8 FOR 1 KHz AT THE LEFT CHANNEL
- TRACK 10 FOR 1 KHz AT THE RIGHT CNANNEL

MEASURING METHOD : - SWITCH THE LP FILTERS ON
- SET THE METER AT 0 DB FOR ONE CHANNEL
- MEASURE THE OTHER CHANNEL FOR CHANNEL SEPARATION

Performance Specifications

1 Optical Pick-up Unit

Actuator

Item			Standard value	Temperature deviation		Remarks
			Room temperature	− 5 ℃	55 ℃	
Focusing	Movable distance		±0.7mm or more	——		With respect to design center position
	DC resistance		7.0±1 Ω	——		
	Sensitivity		1.6 $^{+1.6}_{-0.8}$ mm/v	< −40%	< +45%	Specified at 5Hz
	Resonant frequency (fo)		20±4Hz	< +10Hz	< −5Hz	Specified at maximum Q-value
	Q-value		15±5dB	< −5dB	< +5dB	Q-value = Gain(of)−Gain(5Hz)
	Phase	1kHz	195±7deg	< ±5deg	< ±5deg	
		5kHz	224±7deg	< ±7deg	< ±7deg	
Tracking	Movable distance		±0.5mm or more	——		With respect to neutral lens position
	DC resistance		7.0±1 Ω	——		
	Sensitivity		1.0 $^{+0.8}_{-0.4}$ mm/v	< −35%	< +40%	Specified at 5Hz
	Resonant frequency (of)		18±4Hz	< +8Hz	< −5Hz	Specified at maximum Q-value
	Q-value		20±5dB	< −5dB	< +5dB	Q-value = Gain(of)−Gain(5Hz)
	Phase	1kHz	182±7deg	< ±5deg	< ±5dB	
		5kHz	192±7deg	< ±7deg	< ±7deg	

2 Turntable Unit

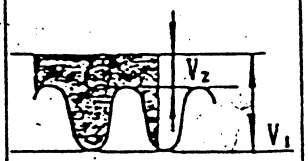
Item	Standard value	Remarks
Height of turntable	19.4 ±0.2mm	From chassis reference plane
Turntable thrust clearance	0.05 to 0.40mm	
Surface vibrations of turntable	< 0.07mm	
Turntable eccentricity	< 0.05mm	
Pressure load of turntable	> 7kgf	
Centering load	50 ±15g	With disk inserted

3 Feed Mechanism (The temperature characteristics standard are indicated as absolute values)

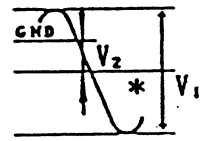
Item		Standard value	Temperature deviation		Remarks
		Room temperature	−5℃	+55℃	
Minimum starting voltage		< 1.2V	< 1.2V	< 1.2V	
Access time		< 4.2sec	< 5.2sec	< 4.2sec	Applied voltage 2V (one way)
Current consumption		< 45mA (ripple 10mA)	< 65mA (10mA)	< 45mA (10mA)	Applied voltage 2V
Movable distance of pick-up	Position of innermost mechanical track	< φ48mm			From center of objective lens
	Position of outermost mechanical track	> φ116mm			From center of objective lens
Make position of limit switch		Make should be completed before pick-up operation reaches mechanically innermost position.			

Optics

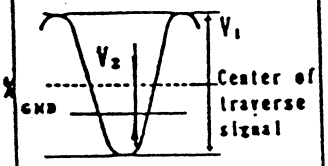
★ RF signal

Item	Standard value	Temperature deviation		Remarks
	Room temperature	− 5 ℃	55℃	
RF level	1.0±0.2Vp-p	< ±15%	< ±15%	APC temperature characteristics excluded
Jitter level	8.5nsec RMS or less	< +2.5 nsec RMS	< +2 nsec RMS	
Crosstalk	$\left\lvert \frac{V_2}{V_1} \right\rvert$ < 45%	<	15	%	
Variation of RF signal envelope	The variation in RF signal envelope must be less than 30% when the objective lens moves with a radial amplitude of ±0.35mm.			

★ Focus error signal

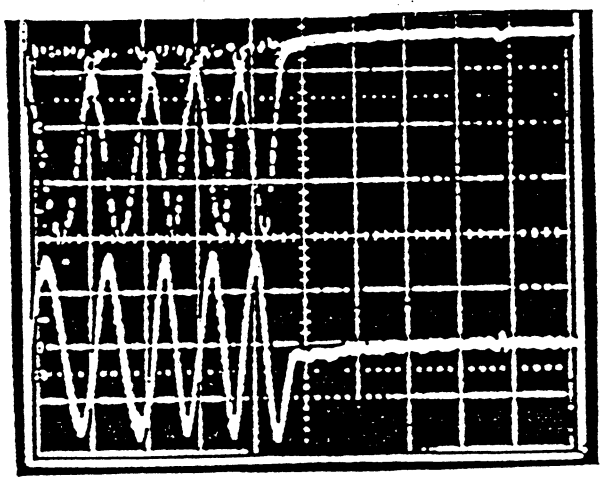
Item	Standard value	Temperature deviation		Remarks
	Room temperature	− 5 ℃	55℃	
S-curve amplitude	19±6Vp-p	< ±20%	< ±20%	S-curve p-p 10.5 μm
Defocusing	< ±1 μm	< ±1 μm	< ±1 μm	Focus bias at optimum jitter level  $\left\lvert \frac{V_2}{V_1} \right\rvert$ × 10.5 μm * Center of S-curve amplitude
Polarity	The focus error signal changes from minus to plus when the objective lens approaches the disc.			

★ Tracking error signal

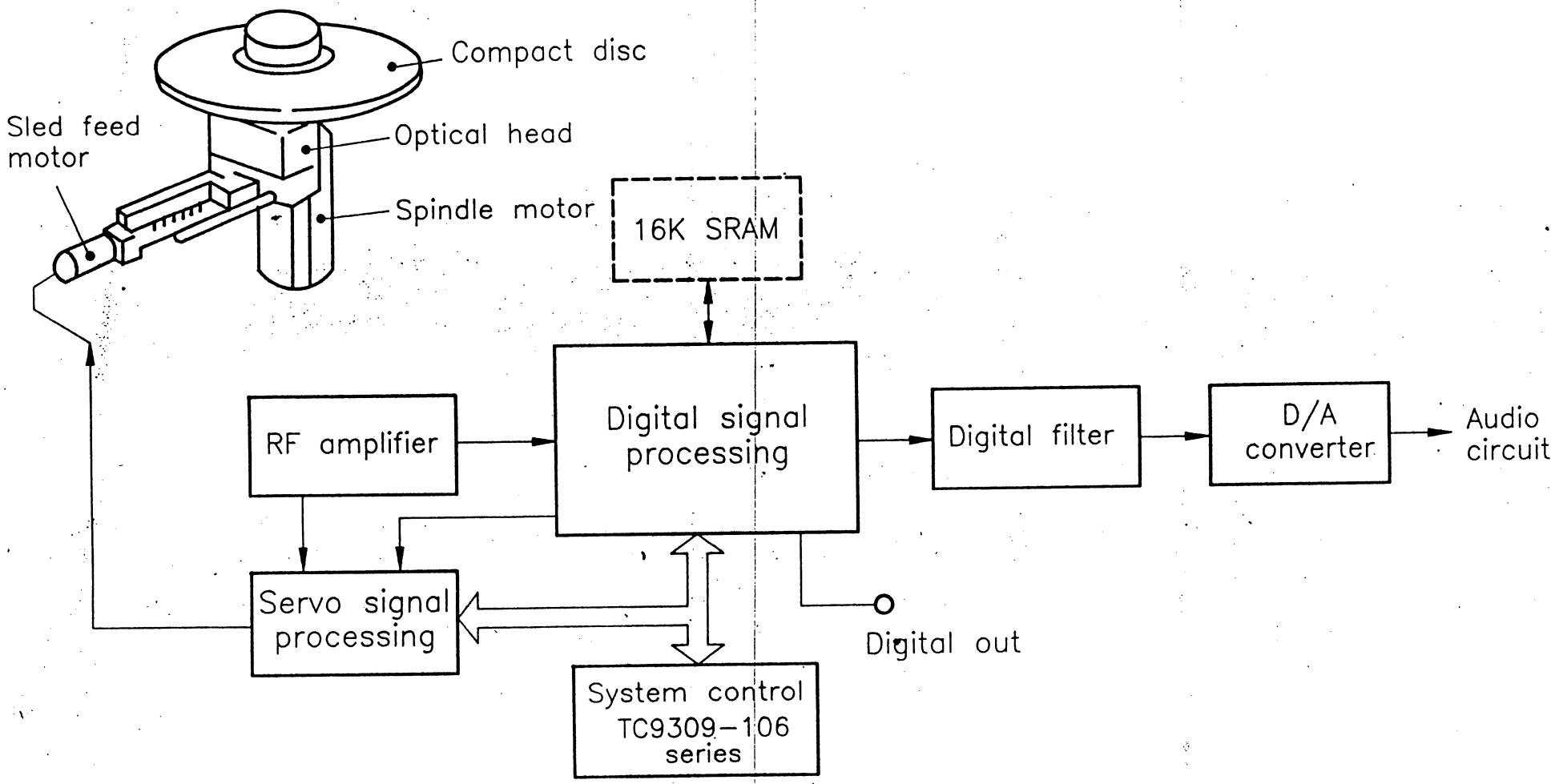
Item	Standard value	Temperature deviation		Remarks
	Room temperature	− 5 ℃	55℃	
Amplitude	14 ± 6Vp-p	< ± 30%	< ± 30%	
E-F balance	$\left\lvert \frac{V_2}{V_1} \right\rvert$ < 20%	< | 10 | %	< | 10 | %	
E-F phase difference	< 55deg	< ± 30deg	< ± 30deg	Electrical angle including R-dependence
Polarity	See below.	Polarity changes when the read spot passes the boundary between signal area (inside) and mirror area (outside).		

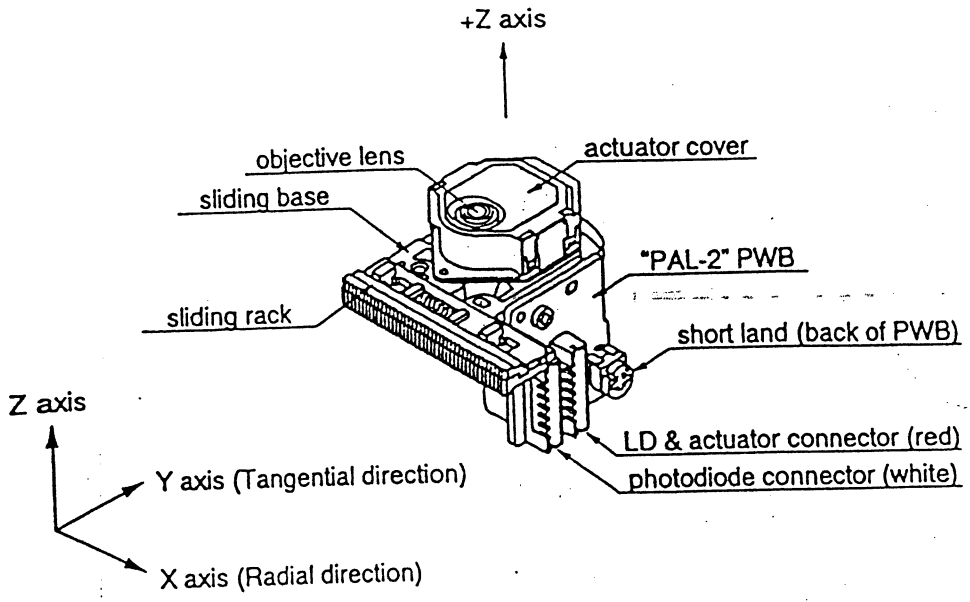
RF Signal

Tracking error signal

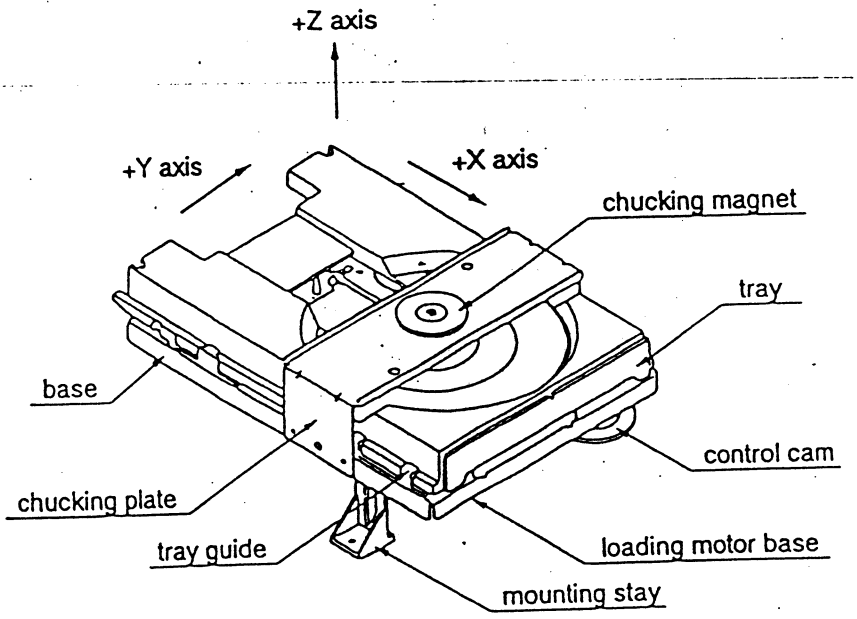


* COMPACT DISC PLAYER BLOCK DIAGRAM



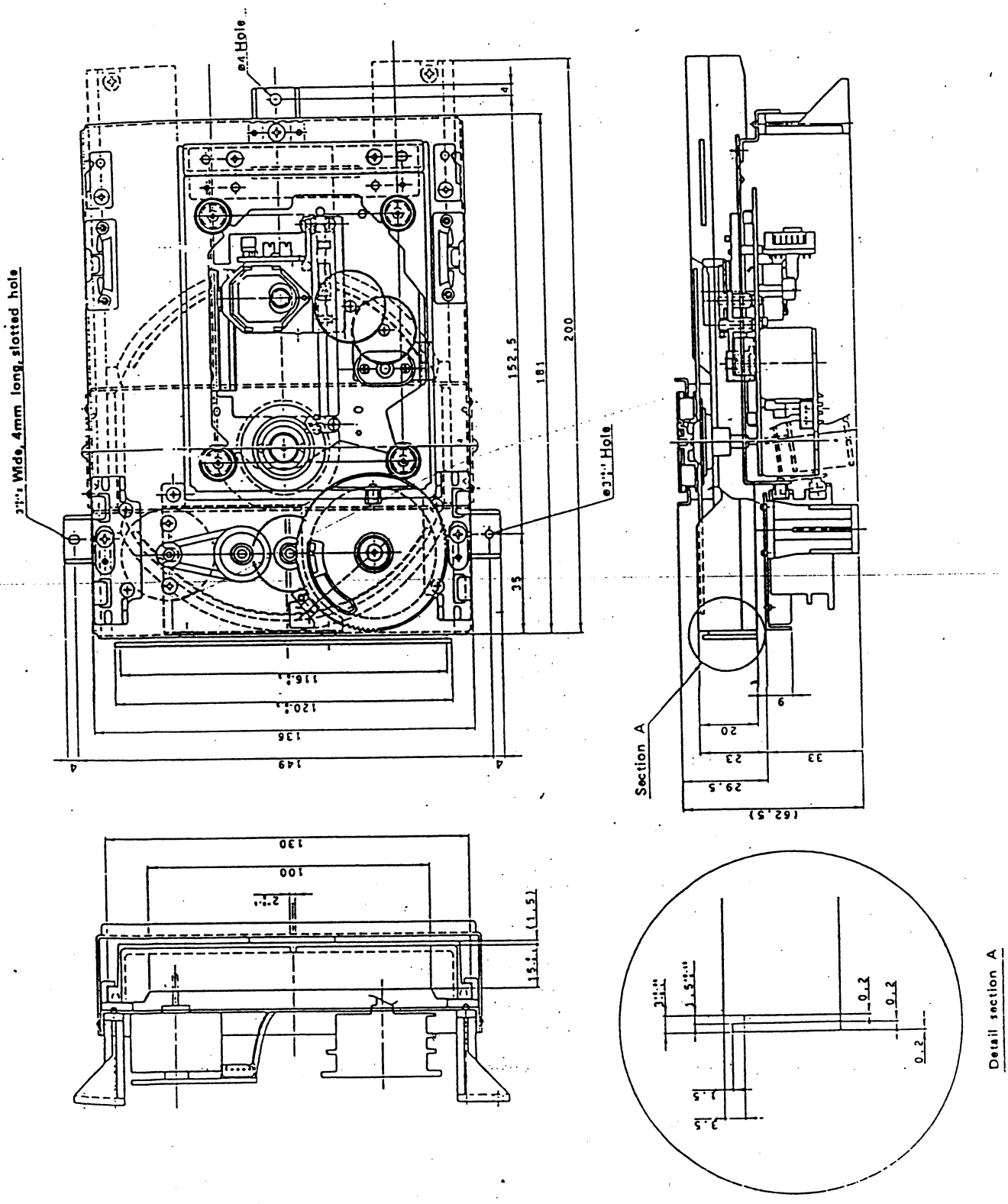


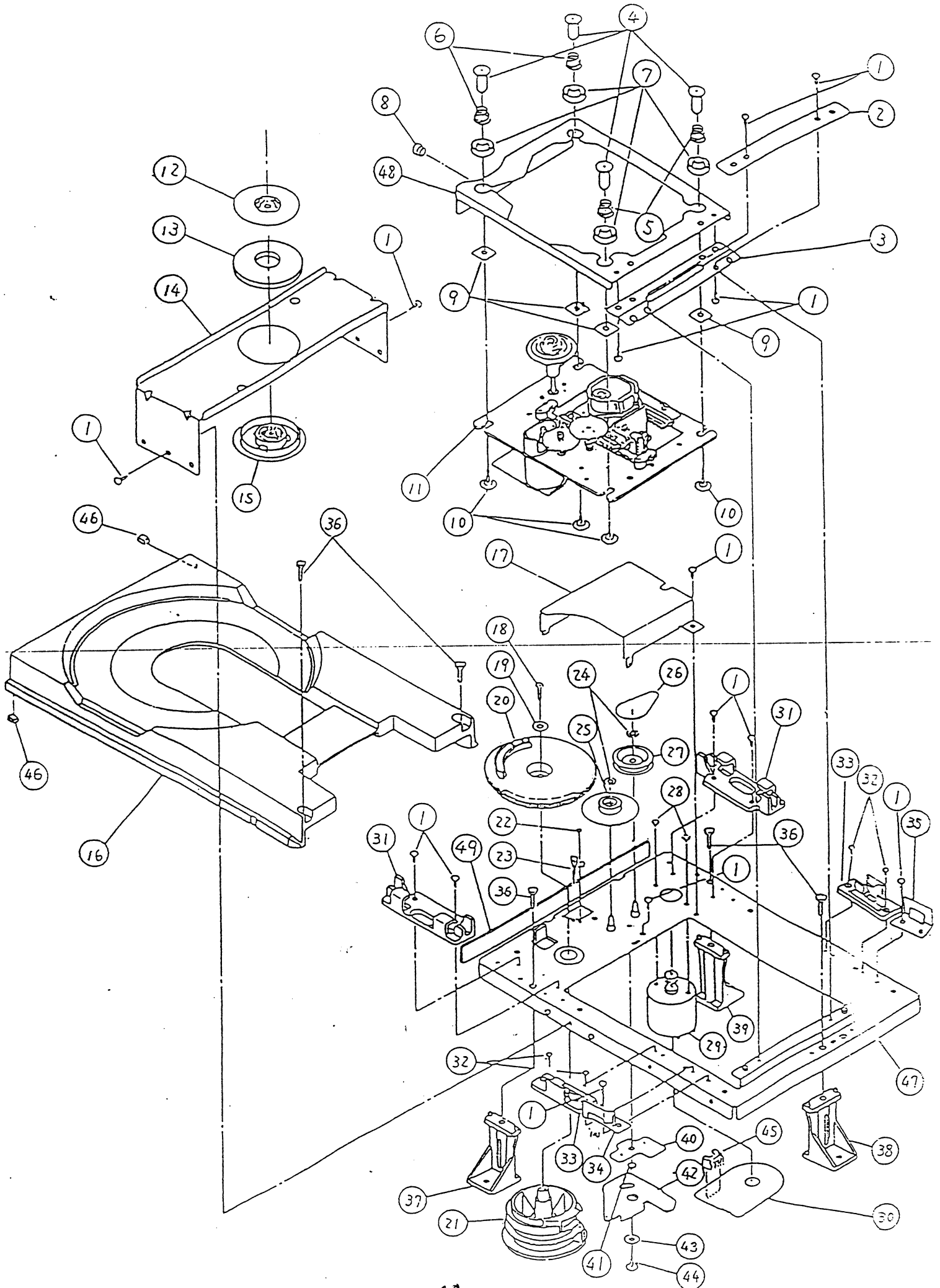
(a) Optical Pick-up



(b) Loading Unit

Fig. 1 Description of the Components


Wide, 4mm long, slotted hole
Hole
Hole
152.5
181
200
35
116
120
136
149
4
4
Section A
9
20
23
33
29.5
(62.5)
130
100
2
15
(1.5)
0.2
0.2
0.2
Detail section A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